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## ***Hurricane coverage:***

### **1 — As Houston dries out, rescues and recovery continue, Houston Chronicle, 8/30/2017**

<http://www.chron.com/news/houston-weather/hurricaneharvey/article/Houston-hunkers-to-Harvey-braces-for-long-storm-12003388.php>

Thousands of homes upstream from the Barker and Addicks Reservoirs have flooded after both dams backed up from heavy rainfall. Area residents likely won't be able to return home for several more weeks.

### **2 — Harvey Makes Landfall In Louisiana As Houston Copes With Record Rainfall, NPR, 8/30/2017**

<http://www.npr.org/sections/thetwo-way/2017/08/30/547227788/harvey-makes-landfall-again-in-louisiana>

Tropical Storm Harvey has made landfall again, this time in Louisiana, says the National Hurricane Center, which said at 4 a.m. local time that the storm hit "just west" of Cameron, La.

### **3 — Shell, Exxon say some pollution released as Harvey hit Texas, CBS, 8/30/2017**

<https://www.cbsnews.com/news/shell-exxon-say-some-pollution-released-as-harvey-hit-texas/>

Exxon, Shell and other companies said pollutants have been released from their refineries operated as torrential rains damaged storage tanks and other industrial facilities on the Texas Coast.

### **4 — Harvey triggers spike in hazardous chemical releases, Politico, 8/29/2017**

<http://www.politico.com/story/2017/08/29/hurricane-harvey-chemical-danger-242142>

Hobbled oil refineries and damaged fuel facilities along the Gulf Coast of Texas from Tropical storm Harvey have released more than two million pounds of dangerous chemicals into the air this week, adding new health threats to Houston's already considerable woes.

### **5 — Houston's polluted Superfund sites threaten to contaminate floodwaters, Washington Post, 8/29/2017**

<http://wapo.st/2xxzOmx>

The Environmental Protection Agency is prioritizing search and rescue for those who were stranded by the storm, but federal and state environmental agencies in the Houston and Galveston areas may soon face contaminated drinking water and flooded wastewater plants.

### **6 — Arkema chemical plant faces explosion risk after Harvey floodwaters, Houston Chronicle, 8/29/2017**

<http://www.chron.com/news/houston-weather/hurricaneharvey/article/Arkema-chemical-plant-faces-explosion-risk-after-12159448.php>

Flood waters from Hurricane Harvey created an emergency situation that could trigger explosions at the Arkema chemical plant northeast of Houston in Crosby. Late Monday night, the facility lost power from both its primary supply and its backup generators due to flooding.

### **7— Exxon Mobil halts operations at Beaumont refinery, San Antonio Express-News, 8/30/17**

<http://www.mysanantonio.com/business/energy/article/Exxon-Mobil-closing-Beaumont-refinery-for-Harvey-12160958.php>

Exxon Mobil said Wednesday it is shutting down its large Beaumont refinery after Tropical Storm Harvey battered the area Tuesday night.

**8— Refineries' toxic gas, Harvey damage, EPA economic reviews, BNA, 8/30/17**

<https://www.bna.com/first-move-refineries-b73014463854/>

Houston's hazardous air pollution has spiked as Hurricane Harvey shuts down refineries and petrochemical complexes. Emergency shutdowns released more than 2 million pounds of harmful pollutants into the air, according to initial reports to Texas regulators.

**9 — EDITORIAL: Deadly gumbo and Houton's Katrina: Hurricane Harvey cuts close, Houston Chronicle, 8/29/17**

<http://www.houstonchronicle.com/opinion/editorials/article/Deadly-gumbo-and-Houton-s-Katrina-Hurricane-12159910.php>

Stretches of the city are beginning to emerge from the waters, but Houston remains bookended on east and west by two looming catastrophes - the San Jacinto waste pits and the Addicks and Barker Dams.

**10 — OPINION: Flooding and the city: The big picture, Houston Chronicle, 8/30/17**

<http://www.houstonchronicle.com/local/gray-matters/article/Hurricanes-and-flooding-The-larger-picture-going-12159234.php>

We're still trying to figure out what Harvey means for the city and the region going forward. But before we ask any questions, let's state a fact as plainly as possible: This is the worst storm the U.S. has ever seen.

**11 — OPINION: Will Harvey lead to new thinking about area development?, Houston Chronicle, 8/29/17**

<http://www.houstonchronicle.com/news/columnists/greater-houston/article/Will-Harvey-be-the-storm-that-leads-to-new-12116535.php>

We can't make Houston less flat or change its weather, although steps to slow the pace of climate change could make a difference over the long term. What we can do is rethink how and where we build the houses, shopping centers and parking lots that deflect water rather than absorb it.

**12 — Southwest Louisiana escapes brunt of Harvey after landfall Wednesday, Baton Rouge Advocate, 8/30/17**

[http://www.theadvocate.com/baton\\_rouge/news/article\\_d2cb06e2-8d7a-11e7-adc9-e325e02d7101.html](http://www.theadvocate.com/baton_rouge/news/article_d2cb06e2-8d7a-11e7-adc9-e325e02d7101.html)

The National Guard and Calcasieu Parish Sheriff's Office had a quiet night Tuesday, they both said early Wednesday. Vinton, a town about 20 miles west of Lake Charles, was hit hardest as Tropical Storm Harvey made landfall early Wednesday.

**13 — Crude slips, gasoline jumps as storm shuts a fifth of U.S. fuel output, Reuters, 8/29/17**

<https://in.reuters.com/article/us-global-oil-idINKCN1BA07E>

Refineries with output of 4.1 million barrels per day (bpd) were offline on Tuesday, representing 23 percent of U.S. production, Goldman Sachs said. Restarting plants even under the best conditions can take a week or more.

**14 — The Looming Consequences of Breathing Mold, The Atlantic, 8/30/17**

<https://www.theatlantic.com/health/archive/2017/08/mold-city/538224/>

The flooding of Houston is a health catastrophe unfolding publicly in slow motion. The impact of hurricanes on health is not captured in the mortality and morbidity numbers in the days after the rain. This is typified by the inglorious problem of mold.

**15 — A battered, isolated Port Aransas picks itself up, San Antonio Express-News, 8/30/17**

<http://www.mysanantonio.com/news/local/article/Port-Aransas-now-open-for-cleanup-takes-stock-12159268.php>

This beach island community lay prostrate Tuesday — no internet or phone service, no running water or electricity and a dawn-to-dusk curfew. Days after Hurricane Harvey lashed the Coastal Bend with winds nearing 130 mph, Aransas Pass residents labored under a frontier isolation, knowing next to nothing about the fate of others down the road or across Redfish Bay.

***Other news:***

**16 — This miracle weed killer was supposed to save farms. Instead, it's devastating them., Washington Post, 8/29/17**

<http://wapo.st/2wSqFHZ>

Clay Mayes slams on the brakes of his Chevy Silverado and jumps out with the engine running, yelling at a dogwood by the side of the dirt road as if it had said something insulting. Its leaves curl downward and in on themselves like tiny, broken umbrellas. It's the telltale mark of inadvertent exposure to a controversial herbicide called dicamba.

**17 — Louisiana fights the sea, and loses, The Economist, 8/29/17**

<https://www.economist.com/news/united-states/21727099-has-lessons-americas-climate-change-policy-louisiana-fights-sea-and-loses>

Coastal erosion is one of America's biggest environmental crises. Louisiana contains some of the world's most extensive wetlands, home to a fifth of North America's waterfowl. It is an economic and human disaster, too. The threatened coastal area is home to 2m people and a hub of the oil-and-gas industry.

**18 — Safer approach detailed to reduce nitrogen in plant discharge, Ruidoso (NM) News, 8/29/17**

<http://www.ruidosonews.com/story/news/local/community/2017/08/29/safer-approach-detailed-reduce-nitrogen-plant-discharge/613749001/>

In a continuing effort to improve safety while attempting to meet new stringent federal and state nitrogen standards imposed on the discharge into the Rio Ruidoso of the Regional Wastewater Treatment Plant, operators of the Ruidoso facility are switching to a new carbon source.

**19 — Louisiana coast's insect invader has no taste for sugar cane, New Orleans Times-Picayune, 8/30/17**

[http://www.nola.com/environment/index.ssf/2017/08/insect-invaders-in-south-louis.html#incart\\_river\\_index](http://www.nola.com/environment/index.ssf/2017/08/insect-invaders-in-south-louis.html#incart_river_index)

The plague of insects decimating roseau cane marshes in coastal Louisiana might not be a threat after all to roseau's cash-crop cousin.

# As Houston dries out, rescues and recovery continue

Houston Chronicle Staff Updated 8:27 am, Wednesday, August 30, 2017

210



Photo: Yi-Chin Lee, Houston Chronicle

## IMAGE 1 OF 192

The historical downtown Galveston is underwater from the rain overnight on Tuesday, August 29, 2017, in Galveston. Some parts of the section were above waist-deep.

8:30 a.m.: Tuesday's weather breaks 122-year record

Tuesday's weather broke a 122-year record for the coldest maximum temperature on Aug. 29 in Houston.

The high on Tuesday was just 75 degrees, following days of record rainfall from Hurricane Harvey, said Kent Prochazka, meteorologist with the National Weather Service.

The previous record of 76 degrees was set in 1895.

**Read more** from the Chronicle's Margaret Kadifa.

7:30 a.m.: Finally a weather forecast to help a wet city dry out

Houstonians can expect drier weather on Wednesday, after Harvey moved out of southeast Texas and into Louisiana early in the morning, according to the National Weather

Service.

Flooded roadways are draining. Water levels on many bayous and creeks are expected to drop.



There is a 30 percent chance of scattered showers and thunderstorms across Harris County, said NWS meteorologist Kent Prochazka.

Those showers and thunderstorms are more likely to hit in the afternoon, Prochazka added.

Because of existing high water on creek, river and roads, a flash flood warning is in effect until 10:15 a.m. for Harris, Galveston, southern Montgomery, Fort Bend, southern San Jacinto, Chambers, Brazoria, southeastern Waller, Liberty and southern Polk counties.

6:50 a.m.: Buffalo Bayou water levels hold in some places

Water levels are no longer rising on Buffalo Bayou between State 6 and Dairy Ashford and from San Felipe downstream to the Ship Channel, according to Jeff Lindner, meteorologist with the Harris County Flood Control District.

Levels on the bayou between Dairy Ashford and San Felipe are still on the rise. The bayou could be another 3 feet higher by the end of Wednesday.

the **two-way**

AMERICA

# Harvey Makes Landfall In Louisiana As Houston Copes With Record Rainfall

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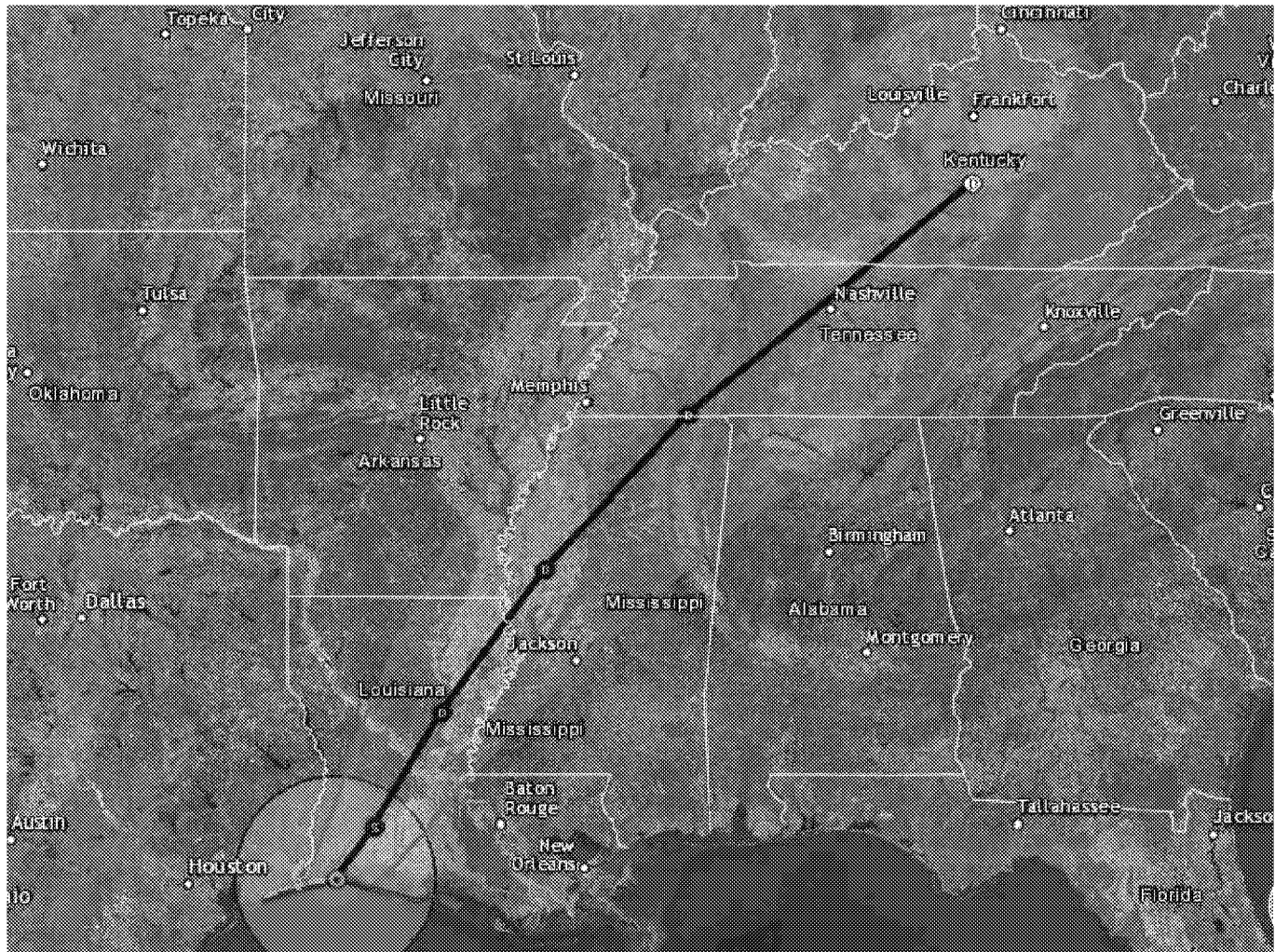
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August 30, 2017 · 5:52 AM ET

BILL CHAPPELL

JAMES DOUBEK



The National Hurricane Center predicts Harvey will move northeast from Louisiana.





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Tropical Storm Harvey has made landfall again, this time in Louisiana, says the National Hurricane Center, which said at 4 a.m. local time that the storm hit "just west" of Cameron, La.

A storm surge warning has been issued for a large section of Louisiana's coastline, stretching from Holly Beach to Morgan City. Parts of Louisiana and Texas are under flash flood warnings through Wednesday morning, affecting areas where hundreds of thousands of people live.

As of Wednesday morning, the confirmed death toll from Harvey is eight, across four Texas counties — although that figure is likely to rise and does not include people who are missing or believed dead.

Harvey's slow movement away from southeast Texas promises some relief from relentless rains that have inundated large swaths of Houston, Beaumont and other areas since a downpour began late last week. Late Tuesday, some Houston residents glimpsed something they hadn't seen for days: the sun.



**Nathan Rott**  
@NathanRott

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6:29 PM - Aug 29, 2017

5 106 493

Harvey dumped nearly 52 inches of rain at one location east of Houston, the National Weather Service said, breaking the record for the greatest amount of measured single-storm rainfall for the continental U.S. (in Hawaii, cyclone Hiki set the national record of more than 52 inches in 1950).

Houston and surrounding areas face the threat of more flooding from rivers. And there are steep challenges in coping with evacuees using an infrastructure that's been crippled. But there was palpable excitement Wednesday morning, when the National Weather Service office in Houston announced, "Our tropical storm warning, storm surge watch, and flash flood watch have all been canceled. Improving weather conditions to come!"



**NWS Houston**  
@NWSHouston

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Our tropical storm warning, storm surge watch, and flash flood watch have all been canceled. Improving weather conditions to come! #houwx

4:27 AM - Aug 30, 2017

8 289 432

Federal and local agencies have saved more than 13,000 people from perilous floodwaters — and those rescue efforts are continuing, as some residents who tried to ride out the storm find themselves in need of aid and shelter.

Along the Texas/Louisiana border and north into western Kentucky, Harvey is expected to bring 3 to 6 inches of rain, the hurricane center says, warning of "isolated amounts up to 10 inches."

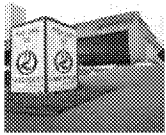
**THE TWO-WAY**  
Here's How You Can Help People Affected By Harvey

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Harvey is moving north-northwest at almost 7 mph. The NHC expects the storm's center to "move across the Lower Mississippi Valley and Tennessee Valley through Thursday." Slow-moving storms can mean more potential for destruction as they hang over an area. Harvey was barely moving when it devastated certain areas in Texas.

The NHC says maximum sustained winds are currently about 45 mph, down from a high of 130 mph when Harvey made landfall in Texas several days ago.

The NHC warns of tropical storm force winds as far as 80 miles from Harvey's center.



#### THE TWO-WAY

After Pressure Mounts, Joel Osteen Says His Houston Megachurch Is Open To Evacuees

"This storm is going to play out over the next 48 to 72 hours and it has tremendous potential to continue to drop heavy amounts of water, and to prevent people from going about their normal daily business in a safe manner," Louisiana Gov. John Bel Edwards warned Tuesday.

New Orleans does not appear on the storm's primary path, but officials are still concerned about the potential for floods — just as the city marked 12 years since Hurricane Katrina flooded and destroyed hundreds of thousands of homes and displaced even more people.

## Harvey Makes Landfall In Louisiana As Houston Copes With Record Rainfall

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To make things worse for Louisiana's largest city, not all of the drainage pumps in New Orleans are working. "The city's pumping system has been under scrutiny since flooding earlier this month exposed infrastructure failures and unreported maintenance issues," NPR member station WWNO reports.



"People are just on edge" in New Orleans as they wait for the storm's impact, WWNO reporter Tegan Wendland told *Morning Edition* on Wednesday. "Every time it rains, people are left wondering if it's going to be a disaster."

hurricane harvey    houston

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# Shell, Exxon say some pollution released as Harvey hit Texas

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Exxon, Shell and other companies said pollutants have been released from their refineries operated as torrential rains damaged storage tanks and other industrial facilities on the Texas Coast.

Shell told state regulators this week that a floating roof over a tank at its oil refinery in Deer Park, Texas, partially sank during the heavy rainfall. The company said 100 pounds of benzene and 100 pounds of toluene were released.

A similar event happened at Exxon Mobil Corp.'s (XOM) refinery in Baytown, Texas. David Gray, a spokesman for the Environmental Protection Agency, said the company reported the release of 15 pounds of benzene. The EPA classifies benzene as a carcinogen. Toluene, a solvent, is less toxic.

A Shell spokesman did not immediately respond to a request for comment.

"This is an unprecedented storm, and we have taken every effort to minimize emissions and safely shut down equipment," said Exxon spokeswoman Charlotte Huffaker. She said the Irving, Texas-based company was monitoring emission levels and was committed to complying with environmental laws.

Other refinery and chemical plant operators have reported releases due to Harvey, which came ashore as a hurricane but was later downgraded to a tropical storm.

The disclosures highlight the danger posed by flooding in a refinery-rich section of the Gulf Coast that stretches from Corpus Christi, Texas, to Louisiana.



The flooding has caused the shutdown of about 15 percent of the nation's refining capacity, sending gasoline prices higher.

Gasoline futures rose 6 cents, or 4.1 percent, to \$1.78 a gallon in trading Tuesday. Retail prices have gained more slowly — up 4 cents in the last week to \$2.38 a gallon, according to auto club AAA.

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## How long will Congress take to fund Harvey recovery?

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company of Saudi Arabia, said it was dealing with restrictions in the flow of crude oil coming in and products like gasoline going out through pipelines and ports.

A company spokeswoman said there was some water in the plant and local roads were flooded.

The operator of a major pipeline carrying fuel to the East Coast announced it was running at a reduced rate too, compounding pressure on the nation's energy system.

The Colonial Pipeline operator said Tuesday the reduction was due to limited supply from refiners around Houston and storm damage to its facilities in several southeast Texas locations. The company said it dispatched workers to the region.

Earlier Tuesday, Motiva Enterprises said that its refinery in Port Arthur, Texas — the biggest in the nation — had cut output to just 40 percent. Motiva, which is owned by Saudi Aramco, the state-owned oil



# Houston's polluted Superfund sites threaten to contaminate floodwaters

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By Darryl Fears and Brady Dennis August 29 at 3:56 PM

As rain poured and floodwaters inched toward his house in south Houston, Wes Highfield set out on a risky mission in his Jeep Cherokee. He drove in several directions to reach a nearby creek to collect water samples, but each time he was turned back when water washed against his floorboard.

“Yesterday as these large retention ponds filled up, eight feet deep in places, kids were swimming in them, and that’s not good,” said Highfield, a scientist at Texas A&M University’s Galveston campus. The Brio Refining toxic Superfund site, where ethylbenzene, chlorinated hydrocarbons and other chemical compounds were once pooled in pits before the Environmental Protection Agency removed them, sits “just up the road, and it drains into our watershed,” he said.

Harris County, home to Houston, has at least a dozen federal Superfund sites, more than any county in Texas. On top of that, the state lists several other highly toxic sites managed by the Texas Commission on Environmental Quality. Up to 30 percent of the county is under water. Like other scientists in the area, Highfield is deeply worried about toxins leaking into the water during an unprecedented rainfall and flooding from Hurricane Harvey that caused dams to spill over for the first time in history. On Tuesday, ExxonMobil reported that two of its refineries east of Houston had been damaged in the flood and released pollutants. “I made a couple of phone calls to colleagues who said bottle up [samples], label them and we’ll run them all,” Highfield said.

On Tuesday, EPA officials in Washington traveled to Houston to monitor environmental risks. On Monday, a spokesman for the Texas commission, Brian McGovern, wrote in an email that its workers “took steps to secure state sites in the projected path of Hurricane Harvey” by removing drums with chemical wastes and shutting down systems. McGovern said that “EPA has been coordinating with potentially responsible parties” that created the federal toxic sites to secure them.

“The TCEQ and EPA will be inspecting sites in the affected areas once reentry is possible,” McGovern wrote. But Highfield and a colleague at Texas A&M, Samuel Brody, want to know what’s in the water now, as residents with children sometimes plunge into it as they waded to safety from flooded homes.

With its massive petroleum and chemical industry, Houston, part of the “Chemical Coast,” presents a huge challenge in a major flooding event, said Mathy Stanislaus, who oversaw the federal Superfund program throughout the Obama administration.

Typically the EPA tries to identify Superfund sites in a major storm’s path to “shore up the active operations” and “minimize seepage from sites,” Stanislaus said. “This is not the time to dictate; it’s the time to work together well with state and local officials to think about needs that need to be met.”

Before Sandy, the powerful and destructive weather system that vacillated between a hurricane and tropical storm as it bore down on New Jersey and New York, the agency rushed to sites in harm’s way. Still, Stanislaus said, “There was some spread of contamination.”

The EPA tested Superfund sites after Hurricane Katrina in 2005 and found that contamination was relatively contained, said Nancy Loeb, director of the Environmental Advocacy Center at Northwestern University’s Pritzker School of Law. But she cautioned that other more risky sites lie in the path of any storm that strikes a major metropolitan area such as Houston.

Risks at Superfund sites where the contamination hasn’t been completely resolved “are of the flooding picking up contaminants as it goes,” Lobe said. “If the water picks up contaminated sediment from sites, that may get deposited in areas where people frequent — residential properties, parks, ballfields — that were never contaminated before. We can’t say for sure it will happen, but it’s certainly a possibility.”

Residents who use well water are especially vulnerable, Loeb said: “There’s no testing of their water to know whether it’s been contaminated.”

In addition to the toxic pits at the Brio in Houston’s Friendswood community, Harris County’s polluted Superfund sites include the low-lying San Jacinto River Waste Pits that “is subject to flooding from storm surges generated by both tropical storms (i.e. hurricanes) and extra tropical storms” that push water inward from Galveston Bay, according to an Army Corps of Engineers report released last year.

There’s also the Many Diversified Interests site near the heart of the city, the Crystal Chemical Co. site in southwest Houston, the Patrick Bayou site off the Houston Ship Channel, and the Jones Road Plume dry cleaning waste site. They include oily sludge and contaminants dangerous to inhale or touch: perchloroethylene, trichloroethylene and chlorinated hydrocarbons, to name a few.

Highfield became alarmed Saturday when he saw teenagers swimming near a football field where water had risen to the crossbar of the goal post. He mentioned what he saw to Brody and recalled that they both reacted with worry.

“I’ve been thinking a lot about this,” Brody said, so much so that the professor instructed a graduate student to analyze the distance between toxic release inventory areas such as Superfund sites and dry cleaners that store chemicals to 100-year and 500-year floodplains where housing and business developments sit.

According to the analysis, the average distance between the facilities to a 100-year floodplain in Harris County was 44 feet, compared with more than 2,000 feet in nearby Galveston and Chambers counties. The average distance to a 500-year floodplain in Harris County was about 70 feet, compared with more than 3,700 feet in Galveston County and 2,300 feet in Chambers County.

“I would love to do a study that combines sampling and physical measurements to understand the confluence of toxins to these flooding events,” Brody says. “When you get water in your home, it’s not just water, it’s sediment and debris. It’s the sediment that these toxic molecules bind to and become dangerous, like dioxins. Once you get water in the home and it has to be cleaned out, people are exposed.”

Both Brody and Highfield said Monday that they were fortunate: Water had not entered their houses. A month ago, Brody packed his family of four and moved from the Friendswood section of Houston that’s now being devastated by the flood, leaving his friend Highfield there. Brody specifically searched for a house on higher ground and is confident that water won’t enter it.

Highfield is less sure as the flood creeps toward his driveway. All around him, houses and cars are underwater. It fuels his concern about what might enter his house with the water, and what his neighbors and their children encounter when they frolic in the water.

“It was absolutely those kids swimming” that triggered his determination to test the water, regardless of whether Texas or the EPA did it. “That was kind of the aha moment. I plotted a path earlier thinking I could get kind of a back road path where I thought the water would be lower at the creek.”

But it was no use. His car was no match for what is by far the worst flooding ever in a city that has flooded since the month it was first founded. “I need it to stop raining. And I need things to drain a little bit,” Highfield said.

### **Read more:**

[The health dangers from Hurricane Harvey’s floods](#)

[See complete coverage of Hurricane Harvey and its aftermath](#)

[Sea level rise could destroy Tampa Bay if a hurricane hits](#)

[Scott Pruitt vows to speed the nation’s Superfund cleanups. Communities wonder how.](#)

# Arkema chemical plant faces explosion risk after Harvey floodwaters

By Matt Dempsey Updated 5:36 pm, Tuesday, August 29, 2017

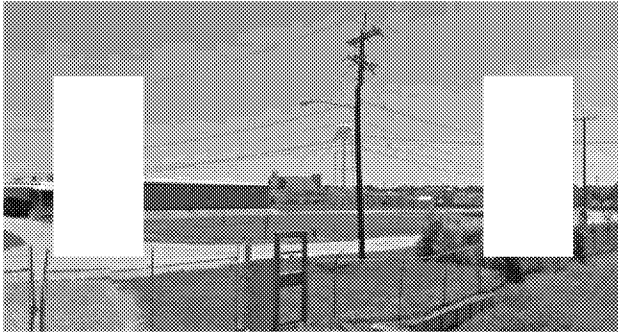


Photo: Google Maps

## IMAGE 1 OF 193

Twelve workers were reportedly trapped early Tuesday morning at a Crosby chemical plant on the brink of catching fire as firefighters were on the way, according to the wife of one of the workers.

Flood waters from Hurricane Harvey created an emergency situation that could trigger explosions at the Arkema chemical plant northeast of Houston in Crosby.

Late Monday night, the facility lost power from both its primary supply and its backup generators due to flooding. Employees moved highly volatile organic peroxides into back-up containers to keep them cool. If this class of chemical gets too hot, it can cause fires or explosions.

**FLOOD CLAIMS: Damages could surpass Ike's \$12.5 billion of insured losses**

"At this time, while we do not believe there is any imminent danger, the potential for a chemical reaction leading to a fire and/or explosion withing the site confines is real," Arkema spokeswoman Janet Smith said on Tuesday.

The Crosby Fire Department evacuated one employee last night and the rest of the staff was evacuated Tuesday afternoon when the refrigeration in some of the back-up containers also

started to fail. The French specialty chemical company produces organic peroxides at the plant.

US President Donald Trump has arrived in Texas to survey the response to devastating Tropical Storm Harvey, the first major natural disaster of his White House tenure, as officials in Houston struggled to manage the record-breaking rains. You can watch his visit live, below. The slow-moving storm has brought catastrophic flooding to Texas, killed at least nine people, led to mass evacuations and paralyzed Houston, the fourth most-populous U.S. city. Some 30,000 people were expected to seek emergency shelter as the flooding entered its fourth day. Officials in Harris County, where Houston is located, said reservoirs built to handle drainage water were beginning to overflow on Tuesday. They urged residents to evacuate as they released water to alleviate pressure on two dams, a move that would add to flooding along the Buffalo Bayou waterway that runs through the area. Officials in Brazoria County, south of Houston, also called for immediate evacuations around a levee Columbia Lakes that had been breached by Harvey's floodwaters. Some 3,500 people already have been rescued from high waters in the Houston area with police, firefighters and National Guard troops continuing to try to locate those marooned in high waters.

Media: Euronews News

It would be surprising if the company had not considered as scenario like this, said Sam Mannan of Texas A&M University's Mary Kay O'Connor Process Safety Center.

Companies typically would have the ability to quench the organic peroxides in situations like this with another chemical so it's no longer dangerous.

"You'll lose the feedstock but it's safer than letting it go into runaway mode," Mannan said.

The plant at 18000 Crosby Eastgate Road, northeast of Houston, has been shut down since Friday in anticipation of the storm.

## HARVEY FROM ABOVE: Aerial photos show impact of the storm

Arkema's Crosby facility is among the Houston-area sites with the highest potential for harm in an incident, according to a 2016 analysis by Texas A&M's Mary Kay O'Connor Process Safety Center and the Houston Chronicle.

It was an organic peroxide, cumene hydroperoxide, that helped land Arkema on that list. Many homes and businesses are within two miles of the facility.

The company is working with the Department of Homeland Security and the state of Texas on a safe location to have a command post to manage the situation.



<http://www.chron.com/business/energy/article/Exxon-Mobil-closing-Beaumont-refinery-for-Harvey-12160958.php>

## Exxon Mobil halts operations at Beaumont refinery

Jordan Blum, Houston Chronicle Updated 9:40 am, Wednesday, August 30, 2017



Exxon Mobil said Wednesday it is shutting down its large Beaumont refinery after Tropical Storm Harvey battered the area Tuesday night.

Exxon Mobil, Motiva Enterprises and Total all are shutting down their refinery complexes in the Beaumont and Port Arthur region. About 20 percent of the nation's refining capacity is now offline.

Exxon Mobil spokeswoman Charlotte Huffaker said Harvey created operational issues that triggered the Beaumont shutdown. Exxon had already halted petrochemical activities at the Beaumont campus.

"We are in the process of a safe and systematic shutdown of the majority of our units," Huffaker said. "Safety is our first priority, and we are taking all precautions to minimize the impact to the community and employees throughout the shutdown process."

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**H E A R S T**

Houston's hazardous air pollution has spiked as Hurricane Harvey shuts down refineries and petrochemical complexes.

Emergency shutdowns released more than 2 million pounds of harmful pollutants into the air, according to initial reports to Texas regulators.

Affected Houston-area refineries include ExxonMobil's sprawling Baytown complex, as well as refineries run by Chevron-Phillips, Petrobas, Royal Dutch Shell. It also includes the shutdown of Motiva Enterprises' Port Arthur facility—the nation's largest crude oil refinery.

While the shutdowns may be necessary from a safety perspective, shutting down boilers and other equipment can produce significant amounts of air pollution. Chevron Phillips reported to Texas' Commission on Environmental Quality that the company expects to exceed permitted limits for several hazardous pollutants, such as 1,3-butadiene, benzene, and ethylene, during shutdown procedures.

Harvey also is taxing the various government responses to damaged energy infrastructure.

A 14-inch pipeline in La Porte, Texas, spewed a toxic gas for several hours—just one of the infrastructure incidents challenging regulators as Harvey dumps record-breaking rain on the state. The Texas Commission on Environmental Quality is monitoring oil, gas, and other facilities reporting spills and giving technical guidance to wastewater operators in flood-impacted areas. And the Pipeline and Hazardous Materials Safety Administration is working with pipeline operators to give them better views of the integrity of their facilities.

Economic modeling can be confusing—even to EPA's Science Advisory Board.

Its members told the EPA that the agency model for evaluating broad economic costs and benefits of air pollution regulations isn't clear enough to help the public. The analysis is intended to help utilities, industries, and policymakers determine the effects of federal regulations on factors like energy prices and employment.

Board members who met Aug. 29 to discuss their draft report on EPA's draft economy-wide model asked for clarifications and transparency on the model's shortcomings.

- "Garbage juice:" North Carolina lawmakers schedule a Wednesday veto-override vote to allow landfill operators to spray leachate and wastewater into the air to manage solid waste.



- Wisconsin's top environmental regulator is joining EPA's regional leadership team in Kansas.
  - Duke Energy could add 700 megawatts of solar-power capacity to Florida's grid by 2021 and stop billing customers for a halted nuclear project under a plan filed with state regulators.
  - Post-Harvey, federal and state leaders should pause to make sure money being spent will help prevent future damage, analysts say.
- 
- Noon | Women in Green forum | How women impact the environmental industry
  - 2 p.m. | EPA webinar | How drought and other environmental concerns affect global water quantity and quality
  - 3 p.m. | World Resources Institute report | Helping Asia's poorest people access water pollution information

"This is a tremendously costly endeavor, and that's why we haven't done it already." — Peter Wilcoxon, head of an EPA Science Advisory Board panel, on finishing a draft report on modeling the economic impacts of regulation.

- A list of Harvey resources compiled by the Association of Air Pollution Control Agencies.
- Governments and business may face more lawsuits for failing to prevent damage from floods, heat waves, and other climate change risks, a commentary published in Nature says.
- A Massachusetts company using ammonia in its refrigeration system is now complying with federal laws, EPA announces.

The EPA is temporarily relaxing various environmental regulations to pave the way for more gasoline availability in crisis-struck Gulf states. That's because gasoline is needed to offset shortages tied to oil refinery shutdowns and flooding, the agency and governors in Texas and Louisiana say.

But the move is leaving biofuel producers confused.

Administrator Scott Pruitt in recent days gave the go-ahead to gas stations in parts of Texas and Louisiana to sell fuel that breaks environmental rules on smog prevention. Those rules involve arcane regulations on the Reid Vapor Pressure (RVP) of gas—which is used to measure ozone threats—and a type of refinement that limits pollutant emissions.

Pruitt, however, isn't allowing sales of gasoline containing 15 percent ethanol (E15), which is banned from sale in the summer months over RVP concerns. That issue has drawn the most attention to the RVP metric in recent years.

"The waivers issued don't do anything to allow expanded E15 blending," Renewable Fuels Association Executive Vice President Geoff Cooper said in a statement. Cooper said the waiver will allow sales of gasoline without any ethanol, a move that he said "seems odd."

The renewable fuel standard requires biofuel blending into gasoline, and now most gasoline sold nationwide contains 10 percent ethanol.

Pruitt also lifted gasoline requirements for 13 Atlanta-area counties. An agency spokesperson said EPA "is ready to act expeditiously" if extreme and unusual supply problems occur elsewhere.

# Deadly gumbo and Houton's Katrina: Hurricane Harvey cuts close

**Looming catastrophes to the east and west reflect political failure.**

Copyright 2017: Houston Chronicle | August 29, 2017 | Updated: August 29, 2017 8:53pm

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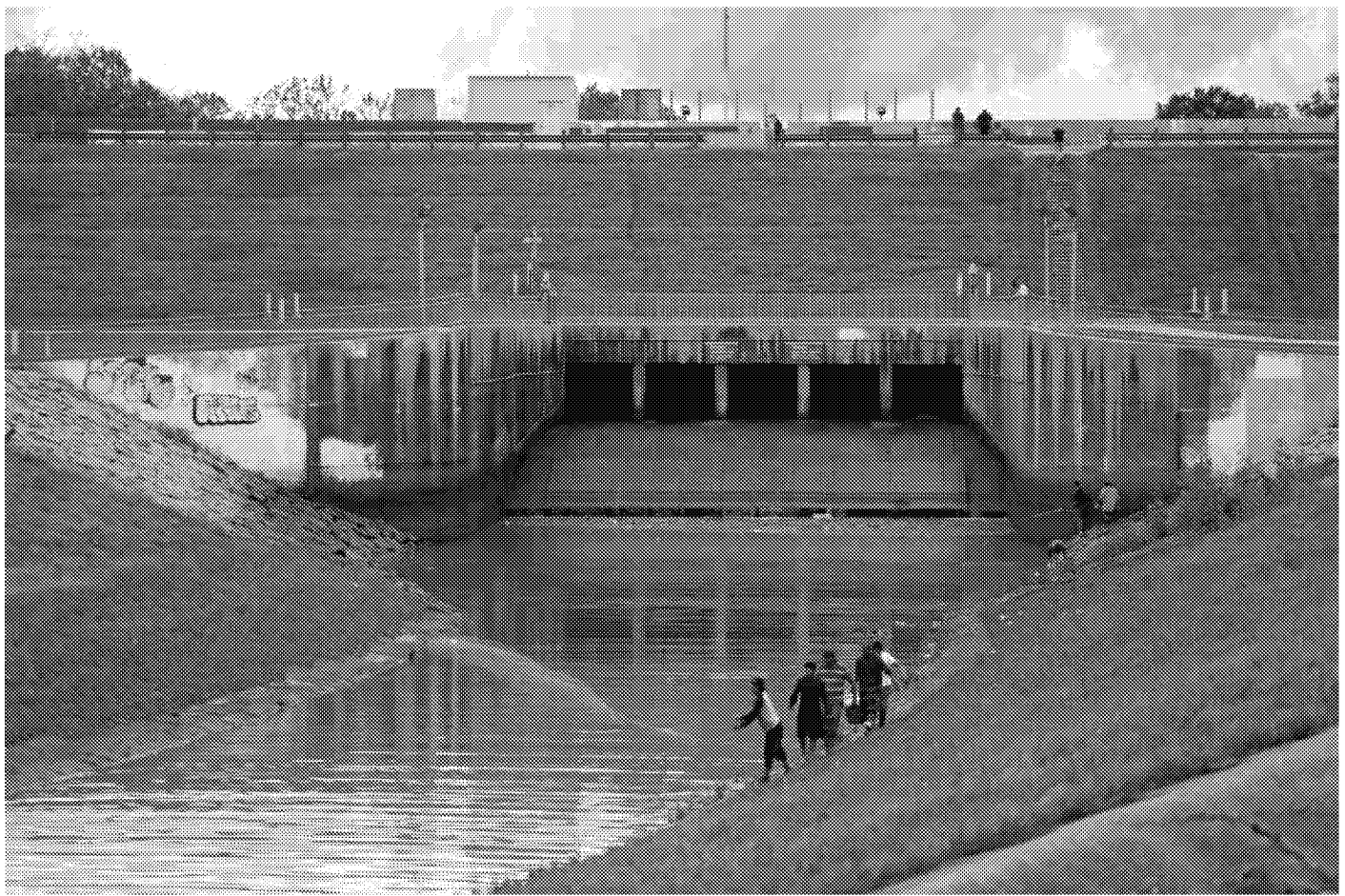


Photo: Gary Coronado, Staff

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A man throws a cast net into the Buffalo Bayou with the Barker Dam and Barker Reservoir in the background in Houston, Texas. The Barker Reservoir and Barker Dam in conjunction with the Addicks Reservoir prevent downstream flooding of Buffalo Bayou in the City of Houston. ( Gary Coronado / Houston Chronicle )

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Stretches of the city are beginning to emerge from the waters, but Houston remains bookended on east and west by two looming catastrophes - the San Jacinto waste pits and the Addicks and Barker Dams.

On the west side, two earthen berms have held back a wall of water that, if it breaks free, would create a deluge unseen since Hurricane Katrina submerged New Orleans.

A failure at Addicks alone would leave nearly 7,000 people dead and inflict \$22.7 billion in property damage, Houston Chronicle reporter Lauren Caruba wrote last year.

So if you think the situation is bad enough, that is how things gets worse.

The U.S. Army Corps of Engineers is acting to head off this unthinkable disastrous scenario. Part of that plan involves releasing water from the two overfilled reservoirs. Millions of gallons will be added to a swollen Buffalo Bayou that already claimed neighborhoods in the Memorial City area and along the Energy Corridor.

We'd like to tell you that these dams, located near the intersection of Interstate 10 and Texas 6, are up-to-date marvels of technology and that everything was under control. But we'd be lying.

The Corps branded both dams with the agency's worst safety rating and labeled them as being at "extremely high risk of catastrophic failure" in 2009. Only four other dams in the nation earned that rock-bottom rating, and none are near a city as big as Houston.

Repairs totaling \$73 million were well underway at Addicks and Barker before Harvey struck. Even if they survive this test of Mother Nature, the work planned to be completed in 2020 will still be insufficient to

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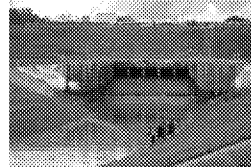
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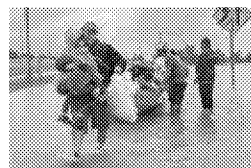
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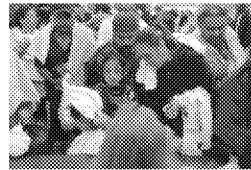


**Wednesday letters: United we stand, build mentality**

**Tuesday letters: Hurricane reflections; Camp Logan**

more than a

adequately handle our region's flooding infrastructure needs.



And now, as rain keeps falling over Houston, the Corps confirms that water flowing around the Addicks Reservoir spillways for the first time in its history. More than 3,000 homes have already flooded. Some may remain underwater for more than a month.



**Ada, OK: This Brilliant Company Is Disrupting A \$200 Billion Industry**

EVERQUOTE

A disaster of this scale may seem unthinkable, but environmental and engineering activists have been ringing the warning bell for years.

This page wrote an editorial last year urging local and federal officials to make the dams an immediate priority. "There's always the chance, however small," we wrote, "that the next storm will be 'the perfect storm.'" We may be living through it. Harris County, though, has preferred to focus on development foremost, even allowing construction within the reservoirs themselves. And you have to look back decades to find an era when Congress prioritized such infrastructure work.

For the time being, our words of encouragement are all directed toward the Corps, and our prayers are with the families who have lost their homes.

But while we fear a dam failure to the west, disaster may have already struck in the east, where the San Jacinto waste pits form one of the most poisonous places in Texas. Lying underneath the San Jacinto River adjacent to the Interstate 10 bridge, the pits hold a toxic sludge of leftover dioxin and other carcinogens deposited by a paper mill in the 1960s.

Now we worry that rushing water and debris ruptured the pits and washed poison downriver.

Activist Jackie Young, a former Miss Rodeo and head of the San Jacinto River Coalition, has long worked to draw attention to this environmental hazard.

Swimmers for years have avoided the San Jacinto River for fear of exposure to pollution, and the fish and crab caught from the waters might as well be balls of poison. What happens if this contamination flows down river to Galveston Bay?

The waste pits are one of at least a dozen federal Superfund sites across the region, and any one of them could transform floodwaters into a deadly gumbo of chemicals and carcinogens.

Last year, the Environmental Protection Agency recommended a full cleanup at San Jac, and yet the waste pits remained in the river.

Why? The companies responsible wasted time by fighting a lawsuit from Harris County, and Congress has long failed to lend the attention and resources needed for a quick cleanup. Now it may be too late.

The waters will soon start to recede and the nation will start to ask how it can help. Any politician serious about our city must dedicate federal resources to dams on the west and pollution on the east. Our city cannot go another year hoping that we avoid a worst-case scenario. Hurricane Harvey has been destructive enough.

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# Flooding and the city: The big picture

**After Harvey, will Houston start asking the tricky questions?**

By Allyn West | August 30, 2017

1



Photo: BRENDAN SMIALOWSKI/AFP/Getty Images

A truck driver walks past an abandoned truck while checking the depth of an underpass during the aftermath of Hurricane Harvey on August 28, 2017 in Houston.

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We're still trying to figure out what Harvey means for the city and the region going forward.

But before we ask any questions, let's state a fact as plainly as possible: This is the worst storm the U.S. has ever seen.

"[It's] off the charts by many measures," writes Mark Fischetti in Scientific American. Stunning, almost cartoonish graphics show the volume of water and scale of a storm worsened by the impact of climate change on a vulnerable region that just keeps getting inundated, one once-in-a-lifetime event after another.

"It's hard to explain the stupefying vastness," Matt Pearce writes in the Los Angeles Times.

Now, though, a few days in, as the rains blow east and away, as armies of volunteers mobilize in boats and form lines at shelters to help those in need and as those of us trapped with no way out scroll through the internet and squirm in our private anxieties, questions about the implications of Harvey are beginning to form.

Some are wondering whether the design of the city, all 627 square miles of it, is to blame. Ian Bogost in the Atlantic questions what he calls "the pavement of civilization."

*"Many planners contend that impervious surface [i.e., roads, parking lots, sidewalks and other pavements, along with asphalt, concrete, brick, stone and other building materials] itself is th*

*problem. The more of it there is, the less absorption takes place and the more runoff has to be managed. Reducing development, then, is one of the best ways to manage urban flooding."*

Bogost also talks to experts in stormwater management who question the typical strategies that Houston employs:

*"Thomas Debo, an emeritus professor of city planning at Georgia Tech who also wrote a popular textbook on stormwater management, takes issue with pavement reduction as a viable cure for urban flooding. 'We focus too much on impervious surface and not enough on the conveyance of water,' he tells me. Even when reduced in quantity, the water still ends up in in pipes and concrete channels, speeding fast toward larger channels. 'It's like taking an aspirin to cure an ailment,' he scoffs. Houston's flooding demonstrates the impact.*

These are tricky questions, anyway, questions that Houston hasn't always been good at answering. Is the city developing responsibly? What would that look like? Is the region managing stormwater as well as it can? Who should we be listening to?

What *should* we be building, as we rebuild?



Photo: BRENDAN SMIALOWSKI/AFP/Getty Images

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A man dodges flood waters during the aftermath of Hurricane Harvey on August 27, 2017 in Houston.

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If business as usual is, at least in part, to blame, another question is whether any of these tricky questions themselves will summon enough force to guide the city and region into what Gov. Abbott calls "a new normal." As the Chronicle's Mike Snyder asks in his recent column: Will Harvey strike us as bad enough that it leads to "new ways of thinking about how Houston should grow?"

And how should Houston grow?

"Our officials are going to have to get used to hearing things they don't want to hear," Rice University's Jim Blackburn tells the Daily Beast. "[Houston's] engineering is based on old statistics that don't take climate change into account. We spend all our time in this part of the world denying climate change, but

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#### TRANSLATOR

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that keeps us from asking the important questions. I think this event has opened up that issue."

And if we ask those important questions, there might be a way to build the city that we must build, Eric Holthaus suggests in Politico:

*"It's possible to imagine something else: a hopeful future that diverges from climate dystopia and embraces the scenario in which our culture inevitably shifts toward building cities that work with the storms that are coming, instead of Sisyphean efforts to hold them back. That will require abandoning buildings and concepts we currently hold dear, but we'll be rewarded with a safer, richer, more enduring world in the end."*

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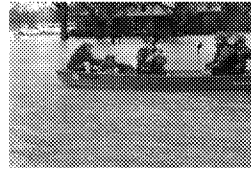
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# Will Harvey lead to new thinking about area development?

By Mike Snyder | August 28, 2017 | Updated: August 29, 2017 8:25am

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Photo: Steve Gonzales

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**IMAGE 1 OF 4**

Houston is losing land cover - places like the Katy Prairie - which helps reduce flooding photographed Wednesday, June 29, 2016, in Waller. ( Steve Gonzales / Houston Chronicle )

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Even before Hurricane Harvey slammed into the Texas coast, the chorus of online scolding had begun.

"Houston will pay a high price for paving over its flood plains with sprawl," Kriston Capps, a writer for CityLab, tweeted Friday afternoon as forecasters struggled to come up with adjectives -- unprecedented, unimaginable, apocalyptic -- to describe the deluge expected in the Houston area.

It's tough to capture nuance in 140 characters, and Capps' tweet failed to convey the complexity of the factors that make Greater Houston vulnerable to catastrophic floods. The role of development, however, is worthy of attention because, at least theoretically, we have the power to do something about it.

We can't make Houston less flat or change its weather, although steps to slow the pace of climate change could make a difference over the long term. What we can do is rethink how and where we build the houses, shopping centers and parking lots that deflect water rather than absorb it.

Single-family homes on big lots far from the city core -- mostly in unincorporated areas where few regulations apply -- represent the predominant form of development in the Houston area. The Katy Prairie, which produces grass that soaks up water like little sponges, lies to the west of the city in the hottest suburban market.

While urban development has enjoyed a resurgence, families still flock to subdivisions and master-planned communities for affordable homes on relatively cheap land. And the area's leaders generally embrace the conventional wisdom that a loosely regulated, market-driven system enables the region to grow and flourish.

Up to now, policy changes aimed at reducing flooding have amounted to little more than tinkering around the edges. And even that has been difficult.

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#### GREATER HOUSTON

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**Struggling mall, aging apartments create challenges in**



**New Katy Buc-ee's has gas pumps as far as the eye can see**



**Pearland draws attention of Democrat Beto O'Rourke seeking**



In 2006, the Houston City Council banned new development on vacant land in floodways. These are the areas closest to the channels of bayous and streams, where flood risks are highest - flood plains on steroids, if you will.



**'KKK origami' case recalls use of religious symbols to promote**



**New Pasadena mayor shows independence with bus service**

But the city retreated two years later, relaxing the new rules in the face of fierce resistance from owners whose property values plummeted as a result of the ban. The

struggle over this relatively modest step illustrates the enormous challenge of undertaking broader changes on a regional scale.

Defenders of the Houston model often cite the value of requirements for stormwater retention to offset runoff. "Banning new development or impermeable surfaces is not the answer," says Tory Gattis, a senior fellow at the Center for Opportunity Urbanism.

Yet skepticism about the effectiveness of such measures, which are inconsistent across the region, is growing. And pressure to do something --- anything - increases as one catastrophic flood after another pummels neighborhoods from Clear Lake to Conroe: Memorial Day 2015. Tax Day 2016. Memorial Day 2016. And now Harvey, which produced a flood anointed as the worst in the city's history days before it was expected to end.

Will this be the storm that finally leads to new ways of thinking about how Houston should grow?

"This is one of those events that will precipitate change," said Jim Blackburn, a Houston attorney specializing in environmental matters. "To some extent the question is, how open are our elected officials going to be to hearing messages that in the past they have not wanted to hear?"

Messages like the need to apply tougher rules not just to new developments, but also to redevelopment of existing properties. Or to consider the impacts of climate change on flooding. Or to preserve the flood-absorbing wetlands and native prairies that haven't already been paved over.

Failure to act boldly, Blackburn argues, could imperil Houston's future. Worldwide images of a paralyzed city, with terrified residents plucked from rooftops by rescuers, could make it harder for vital industries to attract skilled workers.

"This is the time," said Blackburn, "that we can make or break the future of Houston."

For now, of course, the region's leaders are properly focused on the immediate crisis. Recovery from this storm will take years. Sometime soon, though, we must begin to challenge our most comfortable assumptions and pay attention to those messages our leaders don't want to hear. We ignore them at our peril.



**Mike Snyder**

Greater Houston  
columnist

[http://www.theadvocate.com/baton\\_rouge/news/article\\_d2cb06e2-8d7a-11e7-adc9-e325e02d7101.html](http://www.theadvocate.com/baton_rouge/news/article_d2cb06e2-8d7a-11e7-adc9-e325e02d7101.html)

# Southwest Louisiana escapes brunt of Harvey after landfall Wednesday; about 300 sheltered at Civic Center

BY GRACE TOOHEY | [GTOOHEY@THEADVOCATE.COM](mailto:GTOOHEY@THEADVOCATE.COM) AUG 30, 2017 - 7:00 AM



Regugees from Hurricane Harvey flooding Brianna James, 12, Graysion Warren, 9 and Linda Warren, left to right, all from Westlake, make up their cots in the Lake Charles Civic Center Tuesday as people brace for more rain Tuesday into Wednesday.

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Advocate Staff Photo by PATRICK DENNIS

Grace Toohey

The National Guard and Calcasieu Parish Sheriff's Office had a quiet night Tuesday, they both said early Wednesday.

Vinton, a town about 20 miles west of Lake Charles, was hit hardest as Tropical Storm Harvey made landfall early Wednesday, said Calcasieu Parish Sheriff's spokeswoman Kim Myers.

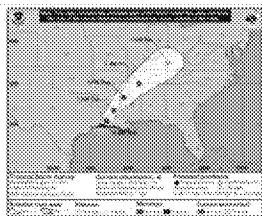
The National Guard made no rescues overnight, while the Sheriff's Office rescued six people total, said National Guard spokesman Sgt. Garrett Dipuma.

*Story Continued Below*

Both agencies remain on call for any reports of flooding or rescues.

Much of southwest Louisiana saw minimal impacts following the landfall of Tropical Storm Harvey early Wednesday, which unfortunately left Beaumont and the most eastern part of Texas taking the brunt of the storm. In 24 hours, Beaumont got 26 inches of rain Tuesday, said National Weather Service meteorologist Tim Humphrey, in their Lake Charles office.

"While we missed out here, certainly 50 miles to the west did see the flooding impacts we predicted," Humphrey said.



### Harvey makes landfall again in southwest Louisiana, expected to weaken as it moves north

Many people, however, remained camped out in the Lake Charles Civic Center, which was prepared to hold more than 700 displaced residents as of Tuesday night. About 300 people had relocated there as of Wednesday morning.

Catherine Mott, 60, sat propped up by two pillows on her cot in the Lake Charles Civic Center Tuesday night, content with her spot along the wall of the large floor so her oxygen tank could stay plugged in.

"I feel better, and safer, here," Mott said.

She had called for help evacuating from her home in Le Bleu, just outside of Lake Charles, after watching the rice fields, roads and all typically-dry land swell with water.

"I've only seen it one other time like that before," Mott said, who's lived there for 30 years. "Everything was flooded."

She said her nieces and nephews had taken tubes outside earlier in the day to enjoy the almost lakes that had become their neighborhood -- but she wanted to get out before it got worse.

*Can't see video below? Click here.*

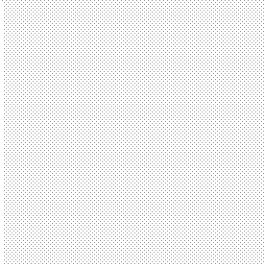


Couple Jarri Nicholson and Kasey Coleman had a more impromptu departure from their new Lake Charles home. The National Guard knocked on their door around 11:30 p.m. Monday night, telling them to leave. The water in their neighborhood had become waist-deep, Nicholson said.

"We were about to go to sleep, we didn't know we were in danger of being washed away," Nicholson said from the Lake Charles Civic Center, where he and Coleman had fixed up a corner with two cots for them to wait out the storm surrounded by about 200 others.

As the storm moves north, the Sabine River basin area, which includes the most western portions of Louisiana, is looking at five to 10 inches of rain. The Lake Charles area, on the edge of that, is forecasted to get three to six inches, Humphrey said.

Lake Charles is experienced 20 to 25 mph winds early Wednesday, but tropical storm gusts are possible, potentially around 30 mph, Humphrey said.



### Lake Charles first responders rescuing some residents; asking others to leave vulnerable neighborhoods

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# Crude slips, gasoline jumps as storm shuts a fifth of U.S. fuel output

Alex Lawler



FILE PHOTO: The Exxon Mobil Beaumont Polyethylene Plant is seen during tropical storm Harvey in Beaumont, Texas, U.S. August 28, 2017.

Jonathan Bachman/File Photo

LONDON (Reuters) - Crude oil slid and gasoline futures hit their highest since mid-2015 on Wednesday as flooding and damage from Tropical Storm Harvey shut over a fifth of U.S. refineries, curbing demand for crude while raising the risk of fuel shortages.

Refineries with output of 4.1 million barrels per day (bpd) were offline on Tuesday, representing 23 percent of U.S. production, Goldman Sachs said. Restarting plants even under the best conditions can take a week or more.

“It will be a while before operations can return to normal and the U.S. refining industry is bracing itself for an extended shutdown,” Stephen Brennock of oil broker PVM said.

Brent oil LCOc1, the international benchmark for crude trading, was down 50 cents at \$51.50 a barrel by 1239 GMT. U.S. crude CLc1 fell 44 cents to \$46.00.

In refined products, price movement was more dramatic and gains increased after sources on Wednesday said Total’s Port Arthur, Texas, refinery had been shut by a power outage resulting from the storm.

U.S. gasoline futures RBc1 were up 5 percent at \$1.8732 a gallon, having earlier hit \$1.9009, the highest since July 2015. Diesel futures HOc1 advanced by 2 percent to \$1.6986 a gallon, having touched their highest since January at \$1.7161.

“Crude is always easier to replace than products,” said Olivier Jakob, analyst at Petromatrix. “If the refineries stay shut for more than a week or 10 days, it’s going to be very problematic.”

Harvey made landfall on Friday as the most powerful hurricane to hit Texas in more than 50 years, resulting in the death of at least 17 people.

In addition to shutting oil refineries, about 1.4 million bpd of U.S. crude production has been disrupted, equivalent to 15 percent of total output, Goldman Sachs said.

The impact of the storm overshadowed the latest weekly figures on U.S. supplies from the American Petroleum Institute (API) and a 360,000-bpd drop in Libya's output due to renewed unrest in the OPEC producer.

U.S. crude inventories fell by 5.78 million barrels last week, the API industry group reported on Tuesday, suggesting a gradual tightening of the U.S. oil market. The figures, however, do not reflect the impact from Harvey. [API/S]

Traders are awaiting the latest U.S. government inventory report, due at 1430 GMT from the Energy Information Administration, to compare with the API figures.





<http://www.mysanantonio.com/news/local/article/Port-Aransas-now-open-for-cleanup-takes-stock-12159268.php>

## A battered, isolated Port Aransas picks itself up

By Sig Christenson Updated 7:46 am, Wednesday, August 30, 2017



IMAGE 1 OF 48

Glen Gonzales, 47, helps Brenda Travieso, 53, both from San Antonio, remove personal belongings from a travel trailer in the Tropic Island Resort in Port Aransas, Texas, Tuesday, August 29, 2017. The trailer ... more

PORT ARANSAS — This beach island community lay prostrate Tuesday — no internet or phone service, no running water or electricity and a dawn-to-dusk curfew. Days after Hurricane Harvey lashed the Coastal Bend with winds nearing 130 mph, Aransas Pass residents labored under a frontier isolation, knowing next to nothing about the fate of others down the road or across Redfish Bay.

Yet they were on their feet and volunteers were starting to arrive with water, brooms, shovels and a neighborly spirit that brought Jeanne Jonas to tears.

**RELATED:** Smaller Central Texas towns slammed by Hurricane Harvey on road to recovery



A crew from Church Unlimited descended on her one-story home, where a thick layer of mud covered the floor and the furniture

you that really, there is a God," she came from nowhere to help

dentul.

#### Now Playing

Members of the denomination, which has 11 campuses, rescued in Houston, Aug. 28, 2017. Bats find refuge in the p... Surfer Tal... de the IGA supermarket on... Approach... moon, they were running a distribution hub for at least 2 tons of bottled water.

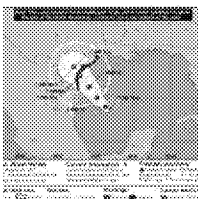
At least eight in every 10 homes and businesses were destroyed or damaged, Port Aransas police Lt. James Stokes said. There have been no storm-related fatalities reported, and so far no arrests, including for looting, which remains a concern for some throughout the region.

#### RELATED: As Houston dries out, rescues and recovery continue

Just how many residents Harvey left homeless was unknown, but Stokes called it "a significant amount." He couldn't say where they could go but hoped they would have families to fall back on.

Utility poles had been bent by high winds or pushed to the ground for miles along the road into town. Up to 90 percent of homes had taken some damage, police estimated. Some were completely shattered, not far from others left intact.

#### Related Stories



**Texas beaches closing as Hurricane Harvey makes its way toward coast**

Retired Austin construction company owner Arthur Serrano, 58, was relieved to see a group of the church volunteers at his home, which had been inundated by 6 feet



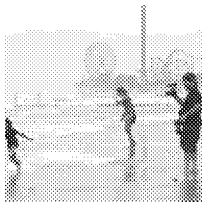
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**50 images that show Harvey's destructive trek into Texas**

of water and had a gooey, smelly layer of mud on the garage floor.

"Well, I just want to say, it almost makes me cry," Serrano said. "When they drove up and said, 'Hey, we're here to help you,' and then we all got together and we said a prayer, I had to fight the tears because so much here looks insurmountable and we're thinking we had weeks of work ahead of us."

**RELATED:** Harvey horror: Shivering tot found clinging to drowned mom

At the grocery parking lot, church members Jason and Courtney John helped unload the water and other

supplies, basics ranging from snacks and canned food to diapers, baby formula and paper plates for delivery wherever needed. Making people aware was still an issue.

"People are driving up, getting the things they need, but we're trying to spread the word," Courtney John said. "Just driving by, people don't understand what's going on."

As if to amplify the point, people in a passing truck turned to stare at the volunteers, not sure of what to make of the scene.

"Come get some stuff, guys!" she cried.

Movement was difficult and information about the outside world was hard to come by.

"We haven't had television or internet or cellphones or any kind of social media, phone calls, any of that kind of stuff for several days," Stokes said, noting that it hadn't hurt his police department's ability to do its job. "We are slowly starting to get those

capabilities back, but they are very spotty and hit and miss at this point, so we haven't been able to get anything consistent."

**RELATED:** Harvey floods shelter for evacuees in Texas

Residents and those who own weekend homes streamed into town to inspect the damage. Pete Lozano, 64, of San Antonio arrived Monday — the first day people were allowed to come back — to check the retirement home he owns with his wife, Ludi.

"What they're going to need is a whole lot of disaster aid to rebuild this community," said Lozano, who once coordinated evacuations for the Texas Department of Public Safety.

The recovery, for now, consisted of painfully small steps — picking up boards, throwing out ruined clothes and sweeping debris into piles. Madelyn Haas, whose mother's jewelry store was inundated by 4 feet of water, worked with other church volunteers at Serrano's home.

She wasn't bothered by the muddy work.

"It doesn't really matter. I'm feeling good that I'm helping," said Haas, 33, of North Padre Island.

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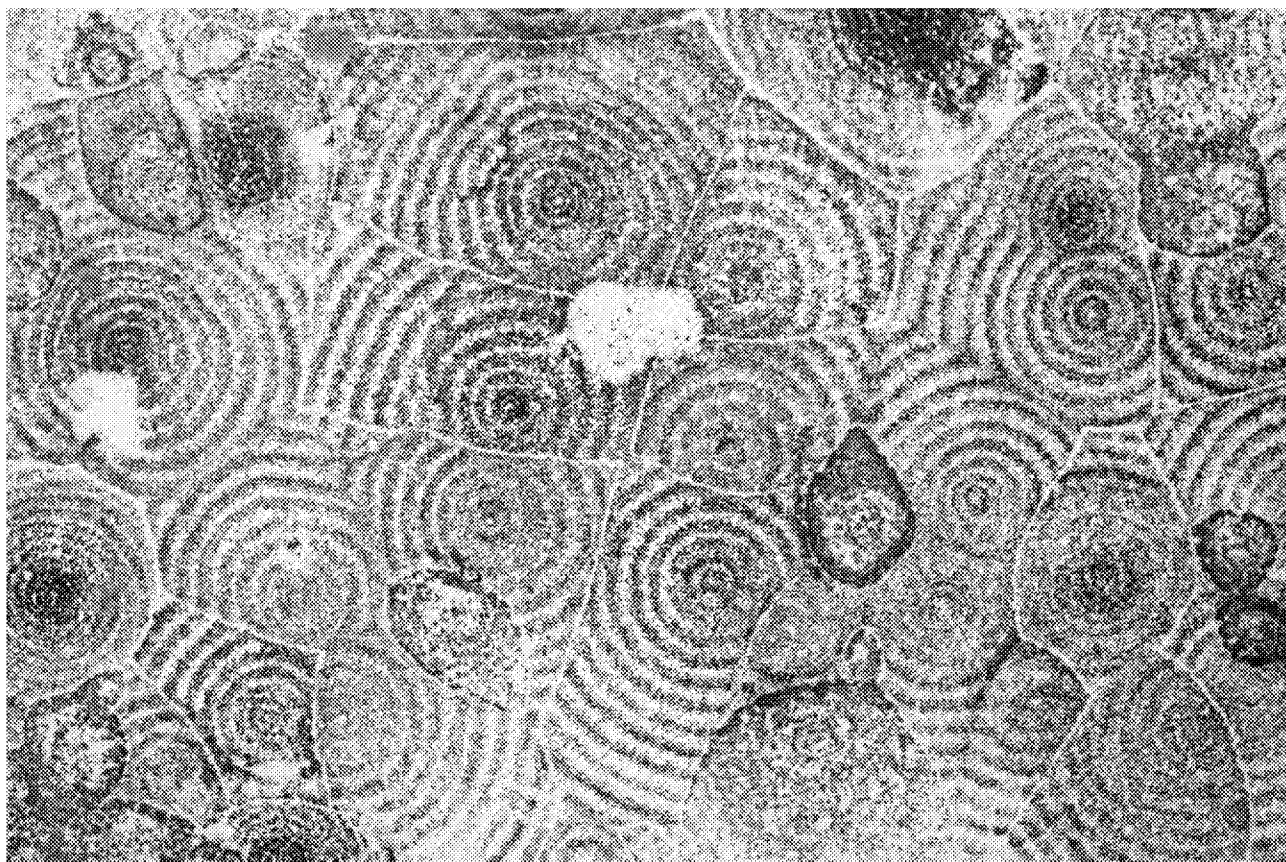
Another volunteer, Bill Robinson, planned to help out until teachers report at Flour Bluff Primary School, where he is an assistant principal. Clutching a pair of hammers and a nail puller, he said folks would help him if the tables had been turned.

"I'm here by choice," said Robinson, 57, of North Padre Island. "If I had a choice, I could be anywhere I want. This is where I want to be, helping out people with our church and serving alongside our brothers — what Jesus would want us to do: help each other."

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# The Looming Consequences of Breathing Mold

Flooding means health issues that unfold for years.



Mold grows in concentric circles on a ceiling in a New Orleans apartment after Hurricane Katrina.

Lucas Jackson / Reuters

JAMES HAMBLIN

4:30 AM ET | HEALTH

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The flooding of Houston is a health catastrophe unfolding publicly in slow motion. Much of the country is watching as 50 inches of water rise around the chairs of residents in nursing homes and submerge semitrucks. Some 20 trillion gallons of water are pouring onto the urban plain, where developers have paved over the wetlands that would drain the water.

The toll on human life and health so far has been small relative to what the images suggest. Authorities have cited thirty known deaths as of Tuesday night, while 13,000 people have been rescued. President Donald Trump—who this month undid an Obama-era requirement that infrastructure projects be constructed to endure rising sea levels—offered swift reassurance on Twitter: “Major rescue operations underway!” and “Spirit of the people is incredible. Thanks!”

But the impact of hurricanes on health is not captured in the mortality and morbidity numbers in the days after the rain. This is typified by the inglorious problem of mold.



Two years after Hurricane Katrina, a New Orleans resident poses in his mold-infested home. (Alex Brandon / AP)

Submerging a city means introducing a new ecosystem of fungal growth that will change the health of the population in ways we are only beginning to understand. The same infrastructure and geography that have kept this water from dissipating created a uniquely prolonged period for fungal overgrowth to take hold, which can mean health effects that will bear out over years and lifetimes.

The documented dangers of excessive mold exposure are many. Guidelines issued by the World Health Organization note that living or working amid mold is associated with respiratory symptoms, allergies, asthma, and immunological reactions. The document cites a wide array of “inflammatory and toxic responses after exposure to microorganisms isolated from damp buildings, including their spores, metabolites, and components,” as well as evidence that mold exposure can increase risks of rare conditions like hypersensitivity pneumonitis, allergic alveolitis, and chronic sinusitis.

A potentially dangerous species of mold grows in an apartment in Kenner, Louisiana, after Hurricane Katrina. (Lucas Jackson / Reuters)

Twelve years ago in New Orleans, Katrina similarly rendered most homes unlivable, and it created a breeding ground for mosquitoes and the diseases they carry, and caused a shortage of potable water and food. But long after these threats to human health were addressed, the mold exposure, in low-income neighborhoods in particular, continued.

The same is true in parts of Brooklyn, where mold overgrowth has reportedly worsened in the years since Hurricane Sandy. In the Red Hook neighborhood, a community report last October found that a still-growing number of residents were living in moldy apartments.

Brent Davis helps clean out a home damaged by floodwaters from Hurricane Matthew in Nichols, South Carolina, in October 2016. (Mike Spencer / AP)

The highly publicized “toxic mold”—meaning the varieties that send mycotoxins into the air, the inhaling of which can acutely sicken anyone—causes most concern right after a flood. In the wake of Hurricane Matthew in South Carolina last year, sludge stood feet deep in homes for days. As it receded, toxic black mold grew. In one small community, Nichols, it was more the mold than the water itself that left the town’s 261 homes uninhabitable for months.

Researchers from the National Resources Defense Council held a press conference after Katrina about dangerously high levels of mold spores in the air. The group accused the Environmental Protection Agency of focusing only on exposures like



arsenic, lead, asbestos, and pollutants such as those found in gasoline, while ignoring mold exposure.

The overwhelmed EPA did at the time issue radio announcements and distribute brochures encouraging people to wear respirators when reentering flooded buildings, particularly when cleaning and ripping out drywall. These are occupational exposures that fall mainly on manual laborers.

A sommelier in New Orleans displays a mold-damaged bottle of Opus One 1997 after Katrina. (Gerald Herbert / AP)

The more insidious and ubiquitous molds, though, produce no acutely dangerous mycotoxins but can still trigger inflammatory reactions, allergies, and asthma. The degree of impact from these exposure in New Orleans after Hurricane Katrina is still being studied.

Molds also emit volatile chemicals that some experts believe could affect the human nervous system. Among them is Joan Bennett, a distinguished professor of plant biology and pathology at Rutgers University, who has devoted her career to

the study of fungal toxins. She was living in New Orleans during the storm, and she recalls that while some health experts were worried about heavy-metal poisoning or cholera, she was worried about fungus.

“I’m still surprised it didn’t receive more attention from the scientific community, she said in a recent interview. “The city was rife with mold; everything organic decayed. A few people did some very superficial spore counts and they were off the scale, but at the time almost no one studied it because the focus was elsewhere. So I did my own study.”

The smell of the fungi in her house got so strong after the flooding that it gave her headaches and made her nauseated. As she evacuated, wearing a mask and gloves, she took samples of the mold along with her valued possessions. Her lab at Rutgers went on to report that the volatile organic compounds emitted by the mold, known as mushroom alcohol, had some bizarre effects on fruit flies. For one, they affected genes involved in handling and transporting dopamine in a way that mimicked the pathology of Parkinson’s disease in humans.

“More biologists ought to be looking at gas-phase compounds, because I’m quite certain we’ll find a lot of unexpected effects that we’ve been ignoring,” said Bennett.

After Hurricane Rita in 2005, a resident of Groves, Texas, appears in his moldy living room. (David J. Phillip / AP)

This is where Trump's words in support of Houston ring hollow.

Under his administration, the funding of science to better understand the health consequences of mold exposure stands to be slashed. Meanwhile, the significance of mold in human lives is expected to increase with rising sea levels and catastrophic weather events. The perennial intensification of severe weather patterns over the Gulf Coast has made flooding increasingly common, at least partly due to the warming of the ocean.

The Environmental Protection Agency, which would typically be tasked with mitigating the health effects of mold in Houston, is currently uprooting the regulations intended to reduce carbon emissions that raise the likelihood of severe weather events. The agency stands only less equipped now to deal with environmental mold contamination than it did in New Orleans.

In Houston, short-term rescue funding is essential to saving lives, and supporting it is politically necessary. But most of the looming threats to human wellbeing will outlast the immediate displays of concern. They will play out when the water and the cameras are gone, and when emergency funds allocated to Houston are exhausted. Mold will mark the divide between people who can afford to escape it and people for whom the storm doesn't end.

#### ABOUT THE AUTHOR

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# This miracle weed killer was supposed to save farms. Instead, it's devastating them.

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By Caitlin Dewey August 29 at 5:38 PM

BLYTHEVILLE, ARK. — Clay Mayes slams on the brakes of his Chevy Silverado and jumps out with the engine running, yelling at a dogwood by the side of the dirt road as if it had said something insulting.

Its leaves curl downward and in on themselves like tiny, broken umbrellas. It's the telltale mark of inadvertent exposure to a controversial herbicide called dicamba.

"This is crazy. Crazy!" shouts Mayes, a farm manager, gesticulating toward the shriveled canopy off Highway 61. "I just think if this keeps going on . . ."

"Everything'll be dead," says Brian Smith, his passenger.

The damage here in northeast Arkansas and across the Midwest — sickly soybeans, trees and other crops — has become emblematic of a deepening crisis in American agriculture.

Farmers are locked in an arms race between ever-stronger weeds and ever-stronger weed killers.

The dicamba system, approved for use for the first time this spring, was supposed to break the cycle and guarantee weed control in soybeans and cotton. The herbicide — used in combination with a genetically modified dicamba-resistant soybean — promises better control of unwanted plants such as pigweed, which has become resistant to common weed killers.

The problem, farmers and weed scientists say, is that dicamba has drifted from the fields where it was sprayed, damaging millions of acres of unprotected soybeans and other crops in what some are calling a man-made disaster. Critics say that the herbicide was approved by federal officials without enough data, particularly on the critical question of whether it could drift off target.

Government officials and manufacturers Monsanto and BASF deny the charge, saying the system worked as Congress designed it.

The backlash against dicamba has spurred lawsuits, state and federal investigations, and one argument that ended in a farmer's shooting death and related murder charges.

"This should be a wake-up call," said David Mortensen, a weed scientist at Pennsylvania State University.

Herbicide-resistant weeds are thought to cost U.S. agriculture millions of dollars per year in lost crops.

After the Environmental Protection Agency approved the updated formulation of the herbicide for use this spring and summer, farmers across the country planted more than 20 million acres of dicamba-resistant soybeans, according to Monsanto.

But as dicamba use has increased, so too have reports that it "volatilizes," or re-vaporizes and travels to other fields. That harms nearby trees, such as the dogwood outside Blytheville, as well as nonresistant soybeans, fruits and vegetables, and plants used as habitats by bees and other pollinators.

According to a 2004 assessment, dicamba is 75 to 400 times more dangerous to off-target plants than the common weed killer glyphosate, even at very low doses. It is particularly toxic to soybeans — the very crop it was designed to protect — that haven't been modified for resistance.

Kevin Bradley, a University of Missouri researcher, estimates that more than 3.1 million acres of soybeans have been damaged by dicamba in at least 16 states, including major producers such as Iowa, Illinois and Minnesota. That figure is probably low, according to researchers, and it represents almost 4 percent of all U.S. soybean acres.

"It's really hard to get a handle on how widespread the damage is," said Bob Hartzler, a professor of agronomy at Iowa State University. "But I've come to the conclusion that [dicamba] is not manageable."

The dicamba crisis comes on top of lower-than-forecast soybean prices and 14 straight quarters of declining farm income. The pressures on farmers are intense.

One Arkansas man is facing murder charges after he shot a farmer who had come to confront him about dicamba drift, according to law enforcement officials.

Thirty minutes down the road, Arkansas farmer Wally Smith is unsure how much more he can take.

Smith's farm employs five people — including his son, Hughes, his nephew, Brian, and the farm manager, Mayes. None of the men are quite sure what else they'd do for work in this corner of Mississippi County.

Dicamba has hit the Blytheville — pronounced “Bly-vul” — region hard. For miles in any direction out of town, the soybeans that stretch from the road to the distant tree line are curled and stunted. A nearby organic farm suspended its summer sales after finding dicamba contamination in its produce.

At the Smiths’ farm, several thousand acres of soybeans are growing too slowly because of dicamba, representing losses on a \$2 million investment.

“This is a fact,” the elder Smith said. “If the yield goes down, we’ll be out of business.”

The new formulations of dicamba were approved on the promise that they were less risky and volatile than earlier versions.

Critics say that the approval process proceeded without adequate data and under enormous pressure from state agriculture departments, industry groups and farmers associations. Those groups said that farmers desperately needed the new herbicide to control glyphosate-resistant weeds, which can take over fields and deprive soybeans of sunlight and nutrients.

Such weeds have grown stronger and more numerous over the past 20 years — a result of herbicide overuse. By spraying so much glyphosate, farmers inadvertently caused weeds to evolve resistant traits more quickly.

The new dicamba formulations were supposed to attack those resistant weeds without floating to other fields.

But during a July 29 call with EPA officials, a dozen state weed scientists expressed unanimous concern that dicamba is more volatile than manufacturers have indicated, according to several scientists on the call. Field tests by researchers at the Universities of Missouri, Tennessee and Arkansas have since found that the new dicamba herbicides can volatilize and float to other fields as long as 72 hours after application.

Regulators did not have access to much of this data. Although Monsanto and BASF submitted hundreds of studies to the EPA, only a handful of reports considered volatility in a real-world field setting, as opposed to a greenhouse or a lab, according to regulatory filings. Under EPA rules, manufacturers are responsible for funding and conducting the safety tests the agency uses to evaluate products.

And although pesticide-makers often supply new products to university researchers to conduct field tests in varied environments, Monsanto acknowledged it did not allow that testing on its commercialized dicamba because it did not want to delay registration, and scientists said BASF limited it.

Frustrated scientists say that allowed chemical companies to cherry-pick the data available to regulators.

“Monsanto in particular did very little volatility field work,” said Jason Norsworthy, an agronomy professor at the University of Arkansas who was denied access to test the volatility of Monsanto’s product.

The EPA and chemical manufacturers deny that there was anything amiss in the dicamba approval process.

“The applicant for registration is required to submit the required data to support registration,” the agency said in a statement. “Congress placed this obligation on the pesticide manufacturer rather than requiring others to develop and fund such data development.”

Manufacturers say that volatility is not to blame. In a statement, BASF spokeswoman Odessa Patricia Hines said the company brought its dicamba product to market “after years of research, farm trials and reviews by universities and regulatory authorities.”

Scott Partridge, Monsanto’s vice president of global strategy, thinks some farmers have illegally sprayed older, more volatile dicamba formulations or used the herbicide with the wrong equipment.

The company, which invested \$1 billion in dicamba production plants last year, has deployed a fleet of agronomists and climate scientists to figure out what went wrong.

“We’re visiting every grower and every field,” Partridge said. “If there are improvements that can be made to this product, we’re going to do it.”

Regulators in the most-affected states are also taking action. In July, Arkansas banned spraying for the remainder of the season and raised the penalties on illegal applications.

Missouri and Tennessee have tightened their rules on dicamba use, while nearly a dozen states have complained to the EPA.

The agency signaled in early August that it might consider taking the new dicamba herbicides off the market, according to several scientists who spoke to regulators.

The agency would not comment directly on its plans. “EPA is very concerned about the recent reports of crop damage related to the use of dicamba in Arkansas and elsewhere,” an agency representative said.

Meanwhile, a class-action lawsuit alleges that dicamba manufacturers misrepresented the risk of their products. The Smiths are considering signing up. Monsanto says the suit is baseless.

There are also early indications that dicamba may not work for long. Researchers have shown that pigweed can develop dicamba resistance within as few as three years. Suspected instances of dicamba-resistant pigweed have been found in Tennessee and Arkansas.

A spokeswoman for Monsanto said the company was “not aware of any confirmed instances of pigweed resistance” to dicamba.

Some critics of chemical-intensive agriculture have begun to see the crisis as a parable — and a prediction — for the future of farming in the United States. Scott Faber, a vice president at the Environmental Working Group, said farmers have become



“trapped on a chemical treadmill” driven by the biotech industry. Many farmers say they think they could not continue farming without new herbicide technology.

“We’re on a road to nowhere,” said Nathan Donley, a senior scientist at the Center for Biological Diversity. “The next story is resistance to a third chemical, and then a fourth chemical — you don’t have to be a rocket scientist to see where that will end.


“The real issue here is that people are using ever-more complicated combinations of poisons on crops, with ever-more complex consequences.”

In Blytheville, at least, one consequence is increasingly obvious: It’s a short, scraggly plant with cupped green leaves and a few empty pods hanging near its stem. At this time of year, this plant should have more pods and be eight inches taller, Mayes said.

“This is what we’re dealing with here,” he said, before shaking his head and turning back to his truck. “We go to work every day wondering if next year we’re still going to have a job.”

 **326 Comments**

Caitlin Dewey is the food policy writer for Wonkblog. Subscribe to her daily newsletter: [tinyletter.com/cdewey](https://tinyletter.com/cdewey).

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Coastal erosion

## Louisiana fights the sea, and loses

*That has lessons for America's climate-change policy*



New York Times/Eyevine

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Print edition | United States Aug 26th 2017 | BATON ROUGE AND ISLE DE JEAN CHARLES

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WHEN Roosevelt Falgout was a boy, the brackish water that now laps within a few feet of his three-room cabin at Isle de Jean Charles was miles off. “There were only trees all around, far as you could see,” recalls the 81-year-old former oyster fisherman, at home on the Isle, a sliver of land in the vast marsh that covers much of southern Louisiana. He and his village’s other men and boys, who are members of the French-speaking Biloxi-Chitimacha-Choctaw tribe, used to hunt and trap muskrat and mink in those oak and hackberry forests.

But salty water, seeping northward from the Gulf of Mexico, killed the trees off long ago; just a few blackened stumps remain, protruding from the open water that now surrounds the Isle. With even a modest storm liable to flood the island and the narrow causeway that connects it to higher ground, the village has become almost uninhabitable. Mr Falgout's 81-year-old wife, Rita, says she lies awake at night worrying that her husband, who has cancer among other ailments, will have a medical emergency during a flood. "It's become too frightening here," she says of her ancestral home, sitting amid a clutter of family photographs, Native American beadwork and Catholic saints. The Isle's 60 residents are due to be resettled further inland, in a \$48m programme approved by the state government last year, and Mrs Falgout says she cannot wait to go.

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The briny intrusion that has put paid to the Choctaw village is devastating southern Louisiana. Between 1932 and 2010 the state lost more than 1,800 square miles (470,000 hectares) of land to the sea, representing about 80% of America's coastal erosion over the period. Recent losses have been especially severe because of an increase in big storms raging in from the Gulf of Mexico—such as

Hurricane Katrina, in 2005, which led to the inundation of New Orleans and 1,836 deaths. Between 2004 and 2008 alone, Louisiana shrank by more than 300 square miles.

This is one of America's biggest environmental crises. Louisiana contains some of the world's most extensive wetlands, home to a fifth of North America's waterfowl. It is an economic and human disaster, too. The threatened coastal area is home to 2m people and a hub of the oil-and-gas industry. It is also the main export point for liquefied natural gas (LNG), the form in which American shale gas is shipped abroad. Southern Louisiana contains five of America's 12 busiest ports and billions of dollars of oil-and-gas infrastructure, including 16 petroleum refineries and thousands of miles of pipeline. In Cameron Parish, one of the state's nine coastal districts, all of which are being eroded by the sea,

\$30bn-worth of new or repurposed LNG infrastructure is under construction. According to a new report by RAND Corporation, a think-tank, infrastructure in the state worth up to \$136bn could be threatened by land loss and increased storm damage, a related threat.

Such numbers focus attention. The effort to shore up Louisiana against the hungry sea, which is run by a state body, the Coastal Protection and Restoration Authority of Louisiana (CPRA), but combines many federal, state and local efforts, costs around a billion dollars a year. In one of America's most Republican states, it is also bipartisan, well-managed and impeccably science-based.

Over the past decade the CPRA has restored 36,000 acres of marshland and dredged up 60 miles of artificial islands, to provide a buffer for the coastline. The agency's latest five-year action plan, approved in April, includes 124 planned or active projects, designed to restore or protect an additional 800 square miles of land over the next half-century, at a cost of \$50bn. American taxpayers will cover most of that; BP, an oil firm, will provide \$15bn, as compensation for the Deepwater Horizon oil spill in 2010. The plan was approved without a whisper of dissent from the legislature, even though parts of it read like a publication of the Intergovernmental Panel on Climate Change, on whose sea-level-rise projections it is indeed based. With its "long-term view, consideration of climate change, and integration of natural systems and community resilience", the CPRA claims its report "leads the nation in ecosystem-restoration thinking."

Many scientists would agree. "No other state has a science-based, environmental restoration and protection project of this rigour," says Justin Ehrenwerth, a former member of Barack Obama's administration, who now runs the Water Institute of the Gulf, a research outfit in Baton Rouge dedicated to mitigating coastal erosion. Many Republicans also agree. "I can't choose the best investment without using the best available science," says Garret Graves, a former head of the CPRA, who now represents Louisiana's sixth district in the House of Representatives. "I've heard people in this building say sea-level rise isn't happening," he says, seated in his office on Capitol Hill. "I can tell you it is, because I've measured it." Such bipartisan consensus, rare in America on any issue, is especially striking on one fundamentally linked to global warming, which many Republicans profess not to believe in. This makes Louisiana's

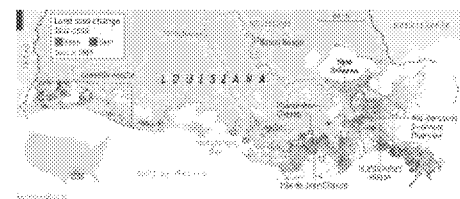
coastal trials, even beyond their environmental and economic significance, an important indicator of how American policymakers will respond to the worsening effects of climate change.

### Flowing out, flowing in

To understand what is causing the inundation, consider how the land was made. Most of southern Louisiana, as well as parts of seven other states, including Arkansas, Mississippi and Missouri, form the Mississippi deltaic plain, a fertile region created over the past 8,000 years by the Mississippi bursting its banks, slowing, and then depositing sediments over the surrounding area. The vastness of the plain—Louisiana's coastline alone is 400 miles long—reflects the Mississippi's huge reach and sediment load; the river, which drains 41% of the contiguous United States, is estimated to transport around 400m tonnes of sediment a year. It also reflects how dynamic the Mississippi is. As it meandered through its delta, the river, for most of those millennia, constantly changed its course through siltation and erosion. Every 1,000 years or so, it abandoned its main channel for one of its distributaries. A time series of the Mississippi's course looks like a sinuous Celtic knot, with a swathe of interwoven curves, flowing to the sea.

Widespread flooding is not compatible with modern living, however. The first levees of the Mississippi were thrown up around New Orleans in the 18th century. After flooding in 1927 displaced over 600,000 people, Congress ordered almost every untamed reach of the river to be straitjacketed by earthworks. Over 1,500 miles of levees were constructed, confining the Mississippi from its source in Minnesota almost to its mouth. This has had some beneficial effects. It has made the river's course more predictable for shipping and accelerated its flow, mitigating the effects of siltation. But it has starved the delta region of the sediment deposits to which it owes its existence.

This alone would be sufficient to cause massive erosion. But two other man-made factors have meanwhile boosted the corrosive power of the sea—the yin to the Mississippi's yang.



Since natural gas was first observed bubbling from a rice paddy in coastal Louisiana in 1901, thousands of oil wells have been sunk into the wetlands. To reach them, almost as many canals have been dredged from the Gulf by energy companies. These channels have injected seams of saline water deep into the marshes, killing plants which tolerate only fresh or brackish water, such as the marsh and woodland species that once surrounded Isle de Jean Charles. This has in turn reduced the amount of organic matter the marshes produce, which acts as a counterweight to another reductive process, the constant settling and compacting of the organic platform that raises the marshland above the water table.

At Pointe-Aux-Chenes, another Native American village a couple of miles inland from the Isle, this transformation is vividly apparent. The small bayou, or waterway, running beside the village has turned salty and almost laps at the road alongside it. The live oaks that gave the village its name (“chêne” means “oak” in French) are giving way to marsh reeds and other estuarine species. As your correspondent surveyed the waterway, a pair of bottlenose dolphins—apex predators in estuarine conditions—arched gracefully from the water.

Starved of silt, and with less new organic matter to counteract its settling, coastal Louisiana is sinking back into its former watery state. Meanwhile, because of melting polar ice caps and thermal expansion, the sea level is rising. In the past decade the observed relative sea-level rise in coastal Louisiana—a figure that combines the effects of rising seas and subsiding land—was over a centimetre a year, or around four times the global average. The delta’s system of land creation has thus been thrown into reverse. In 1930, despite much engineering of the Mississippi’s channel, Louisiana was expanding by almost a square mile a year. Since then, an area the size of Delaware has been lost to the Gulf.

Much of the CPRA’s work involves dredging up sediment where it is abundant, including under the sea, and piping it to areas of threatened marshland. Behind an artificial beach in Cameron Parish, Brett Dupuis, a project manager for Weeks Marine, a dredging company, is working on a \$31m project to restore 740 acres (300 hectares) of submerged marsh, which was inundated by the sea during Hurricane Rita in 2005. For three months his dredging platform, two miles offshore, has been sucking up dirt from the sea bed and piping it ashore. The

result, where open water used to be, is a bed of grey ooze up to ten feet deep, with a slurpy fountain of gunk where the dredging pipe empties into it. “Good thick stuff,” nods Mr Dupuis approvingly, as laughing gulls and brown pelicans wheel and chatter overhead.

### **Welcoming back the water**

It is heartening to observe a habitat formed over centuries being recreated in a few weeks. It also illustrates how Canute-like this approach is. Thousands of square miles of Louisiana are in the process of disappearing; they cannot be replaced by diesel-powered engines an acre at a time. Or, as Mel Landry of the National Oceanic and Atmospheric Administration puts it, while inspecting Mr Dupuis’s progress: “We’ve got more work to do than we could ever pay for.”

Even assuming the CPRA gets the \$50bn it is angling for, it predicts another 1,450 square miles of Louisiana will be lost over the next 50 years. That also assumes the agency is permitted to carry out a more ambitious and controversial sort of marsh-regeneration project, by carving floodgates into the Mississippi’s levees and, at times when the river’s sediment load is high, opening them to inundate the silt-starved plain. The most advanced such scheme, known as the Mid-Barataria Sediment Diversion, would create a channel from the Mississippi, south of New Orleans, capable of funnelling 75,000 cubic feet (2.1m litres) of silty water per second into badly eroded Plaquemines Parish. In full flow, the channel would carry water equivalent to the seventh-largest river in America. The scheme would cost \$1bn and is currently being appraised by the US Army Corps of Engineers, which oversees the management of the Mississippi’s levees.

To preserve southern Louisiana in something close to its current shape, many such diversions might be required. Experts enthusiastically say they could reconnect the river to the delta; others doubt they would work as intended because, as a result of dams and dredging upstream, about half the Mississippi’s sediment no longer reaches its lower course. The boosters are probably right: a big distributary of the Mississippi, the Atchafalaya, which siphons off about a third of the river’s water and more of its sediment load in central Louisiana, has had its basin leveed, but not its banks, and it is making land. Yet resistance to the mooted diversions is fierce.

Such schemes were first discussed in the 1990s, when the scale of the land loss began to be recognised by policymakers. They have since been blocked by a couple of well-organised groups, led by the state's powerful oyster farmers, who have crept further inland with the estuarine conditions in which oysters thrive, and do not want to see their stocks wiped out by a gush of muddy water.

The Corps of Engineers, a slow-moving bureaucracy that distrusts green infrastructure and is reluctant to build floodgates in its levees, presents a different challenge. It says it will take five years merely to review the feasibility of the Mid-Barataria scheme. At the current rate of loss—about a football-field of land every hour—Louisiana will change a lot while the agency deliberates. “The Corps is incapable of responding with the necessary urgency to the coastal erosion crisis in Louisiana,” says Congressman Graves. “The main reason for the erosion is levee-building. It amazes me that the Corps has no sense of guilt about their responsibility. They have an obligation to fix what they broke.”

The damaging effect of the levees was predicted. Weighing the benefits of engineering the Mississippi in 1897, a former president of the American Society of Civil Engineers, E.L. Corthell, noted the need to take into account “withholding by the levees...of the annual contributions of sedimentary matters” and, because of this, “subsidence of the Gulf delta lands below the level of the sea and their gradual abandonment.” But while he warned that “the present generation should not be selfish,” Mr Corthell assumed the economic benefits of protecting the flood zone would “be so remarkable that people of the whole United States can well afford, when the time comes, to build a protective levee against the Gulf waters.”

That illustrates two related weaknesses in much environmental policymaking: an assumption that future politicians will take a longer-term view than current ones, and an excessive willingness to discount the future costs of solving environmental problems caused today. President Donald Trump, though eager to splurge \$20bn on an unnecessary border wall, appears not to have given thought to the seawall Mr Corthell envisaged. In any event, it is doubtful such a scheme would be affordable or otherwise practical, considering the effects of rising sea levels and fiercer storms, both consequences of global warming, which the Republican president either does not believe in or care about.

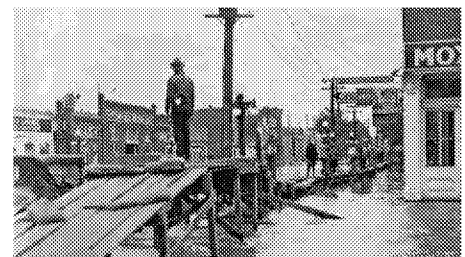


## In a dither

Some of the hoped-for diversions, at least, will probably be built. The political consensus in Louisiana for such action is apparent at every level of government. “We’re all pulling together on this,” says Ryan Bourriaque, the administrator of Cameron Parish. “It’s a great example of how industry, conservationists and different government agencies can all marry.” Mr Graves, who recently became chairman of a House subcommittee that oversees the Corps of Engineers, will also chivvy it relentlessly. Yet anyone looking to Louisiana for hope that America will develop a more rational climate policy is liable to be frustrated. The state’s impressive coastal policy illustrates America’s ability to adapt to a natural disaster that is already upon it. It does not seem to have nudged the state, or the Republican Party, any closer to policies that might slow the warming that is contributing to that disaster.

Louisiana’s former governor, Bobby Jindal, was a strong supporter of the CPRA. While preparing to run for the Republican presidential ticket in 2016, he nonetheless described climate change as a “Trojan Horse” for a left-wing power grab: “It’s an excuse for some who never liked free-market economies and never liked rapid economic growth.” Mr Graves, remarkably, given how averse he seems to talking nonsense on scientific matters, says he shares that view. He also, despite his reliance on the IPCC’s sea-rise projections, says he does not accept the scientific body’s consensus that most of the observed recent warming is caused by human activities.

To plan hugely expensive government action on the basis of the latest climate projections, but at the same time to claim the science underpinning them is too weak to justify curbing greenhouse-gas emissions, as most climate scientists recommend, is at best inconsistent. Perhaps it truly reflects Mr Graves’s thinking. It also seems possible that he wants to keep onside the energy companies which provide around 40,000 jobs in Louisiana and donate generously to his political campaigns. Those firms are responsible, directly and indirectly—through their canal-dredging and because of the greenhouse-gas



The way things were

emissions they facilitate—for a lot of Louisiana's coastal erosion. Yet Mr Graves, moral scourge of the bureaucratic Corps, is also opposed to several ongoing legal campaigns to make the companies pay compensation for the damage they have caused.

It is hard to make sense of this, except perhaps by recourse to Mr Corthell. The present generation should not be selfish. But it always is.

*This article appeared in the United States section of the print edition under the headline "Mississippi blues"*

# Safer approach detailed to reduce nitrogen in plant discharge

Dianne L Stallings, Ruidoso News

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## *Plant manager seeks ways to safely reduce nitrogen in the discharge to the Rio Ruidoso*



(Photo: Dianne Stallings/Ruidoso News)

In a continuing effort to improve safety while attempting to meet new stringent federal and state nitrogen standards imposed on the discharge into the Rio Ruidoso of the Regional Wastewater Treatment Plant, operators of the Ruidoso facility are switching to a new carbon source.

"The first carbon source we were going to use to aid in the reduction of total nitrogen was a methanol, but because of the explosive properties of it and safety issues, we moved to a glycerin-based carbon source, which is a lot safer," Plant Manager Isaac Garcia said during a meeting last week of the Joint Use Board that oversees the operation of the plant. The board consists of members from Ruidoso and the city of Ruidoso Downs.

The cost of purchasing the material may be more, but with no safety issues tagged to the new carbon source, "we won't need the fire department to be locked and loaded at all times," Garcia said. "I think basically, it is a sugar glycerin-type product."

The price will be about \$7,000 per load based on bids he's seen, and the material will be coming from Massachusetts within the next few weeks, he said.

"We'll start playing with it and hopefully, getting our nitrogen level down to the limit to be in compliance (with the amount allowed by the Environmental Protection Agency and New Mexico Environment Department)," Garcia said.

"Your target in that regard is the newly established through mediation?" Mayor Tom Battin, JUB chairman, asked.

The number will be based on a 30-day average flow coming into the treatment plant, Garcia replied. His goal is to meet the figure imposed, which was slightly relaxed since the initial ruling that the plant would have to post the lowest nitrogen discharge in the nation.

Garcia later explained that the previous permit cycle for total nitrogen was determined by temperature.

"When the influent temperature was greater than 13°C, the total nitrogen limit was 4.0 mg/L (milligrams per liter)," he said. "This limit was usually during spring and summer months. When the influent temperature was less than 13°C, the total nitrogen limit was 6.0 mg/L. This limit was usually during fall and winter months.

"The original limit for this upcoming permit cycle was supposed to be an unachievable 1.0mg/L, and then changed to a pound per day limit of 37.1. The promise of the village of Ruidoso and city of Ruidoso Downs to connect a number of sewer onsite systems persuaded the EPA to change the 37.1 pounds per day to 37.8 pounds per day. This limit will not be easily achieved even with the sophistication of a \$32 million dollar (membrane bioreactor) facility.

Deputy Village Manager Ron Sena the five-year permit requires the village to have owners dismantle at least 200 current septic systems and hook up as new connections to the sewer lines leading to the treatment plant.

"Methanol, which is a carbon source usually used in the removal of total nitrogen will not be used, because of its extreme flammable characteristics, making it dangerous to the operators of the facility," Garcia said. "The carbon source which will be used in place of methanol is a glycerin called MicroC, which is not as hazardous as methanol. With careful operations, the addition of the MicroC and various tests of the effluent, we should be able to meet the 37.8lbs per day."

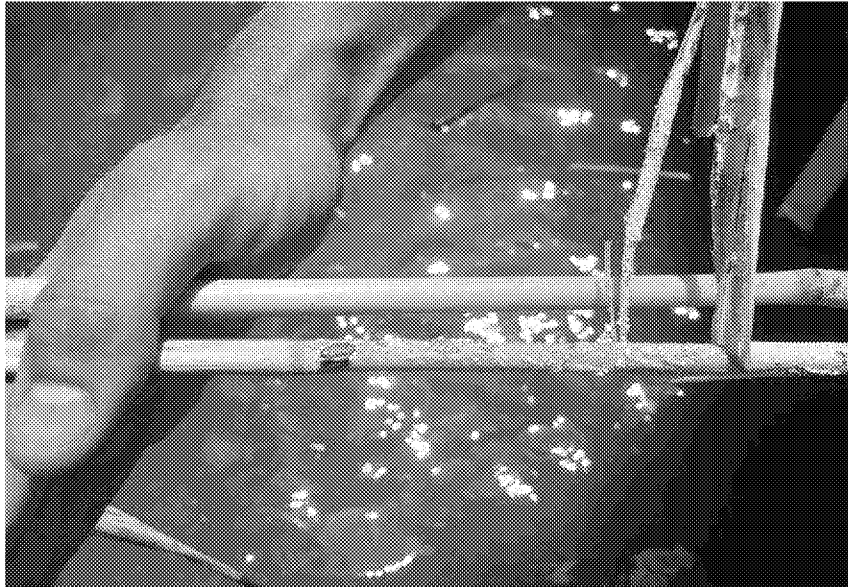
He told JUB members last week, "I hope by adding this carbon source and by doing three samples each month, that we get the dosage right to get (the nitrogen level) down where we need to," Garcia said. "I'm confident we will meet the phosphorous (limit) and everything else. It's the nitrogen that is the biggest challenge."

More costs also will be involved to increase the number of tests for the pollutants, "but we already have quotes for that and have found a lab that can test for those and give us quick results," he said.

LOUISIANA ENVIRONMENT AND FLOOD CONTROL

## Louisiana coast's insect invader has no taste for sugar cane

Comment    Posted on August 30, 2017 at 6:30 AM



A stalk of roseau cane in south Plaquemines Parish shows heavy infestation from a scale insect from Asia.

**By Tristan Baurick,** [tbaurick@nola.com](mailto:tbaurick@nola.com),

NOLA.com | The Times-Picayune

The plague of insects decimating roseau cane marshes in coastal Louisiana might not be a threat after all to roseau's cash-crop cousin. Recent tests by the Louisiana State University AgCenter indicate the tiny sap-sucking pest, known as a scale or mealybug, has little interest in sugar cane, one of Louisiana's most important agricultural products.

Scientists and growers had been worried for months that the scale would switch from roseau cane to the closely related sugar cane as it advanced from Plaquemines Parish to other parts of south Louisiana. But when AgCenter researcher Blake Wilson released the scale, a native of Japan and China, on sugar cane growing in quarantined greenhouses in Baton Rouge, the scale didn't much like the sweet stuff.

"We looked at a couple different varieties of sugar cane, but we were not able to establish that sugar cane would not be a probable host," he said. The AgCenter is also conducting tests with other common Louisiana crops, including sorghum, corn and rice.

The AgCenter's findings made sugar growers cautiously optimistic. "There's always the element of the unknown, but [Wilson's] preliminary results suggest the scale will not be a concern for us," said Herman Waguespack, Jr. of the Thibodaux-based American Sugar Cane League.

The scale's destructive prowess was first noticed late last year in the vast roseau cane stands at the mouth of the Mississippi River in south Plaquemines. Since then, the scale has damaged or killed more than 100,000 acres and spread to at least 10 other parishes and the Bay St. Louis area of Mississippi.

Roseau is a critically important wetland plant. It resists erosion and flooding, and it acts as a land builder by catching and holding passing river sediment. Scale-hit stands are converting to open water in coastal areas already facing rapid land loss from sea level rise, natural subsidence and other factors.

Scientists say the loss of roseau might make the coast less resilient to hurricanes, degrade wildlife habitat, alter shipping channels and expose protected oil and gas infrastructure to storms and waves.

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It's unclear how to stop the scale. A \$378,000 research initiative proposed by the AgCenter in May to combat the scale has not received full funding.

Last week, a group of politicians, Plaquemines community activists and scientists urged the state to declare the rapid roseau die-off an emergency. They called for an "all hands on deck" approach that would rally state agencies and resources toward finding a solution. State leaders have indicated there's little money to fight the problem and more research might be needed before an emergency declaration is issued.

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